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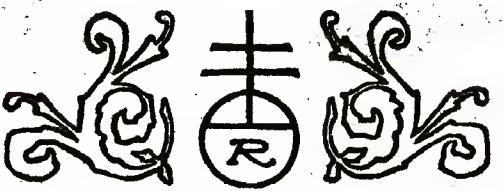
Vol. XVI JANUARY, 1905 No. 1

Little Journeys

To Homes of Great Scientists

By ELBERT HUBBARD

COPERNICUS



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LITTLE JOURNEYS BY ELBERT HUBBARD, FOR 1905 WILL BE TO THE HOMES OF GREAT SCIENTISTS, AND THE SUBJECTS ARE AS FOLLOWS:

Copernicus
Galileo
Sir Isaac Newton
Humboldt
Sir Wm. H. Herschel
Charles R. Darwin
Ernst Haeckel
Carl von Linnæus
Thomas H. Huxley
John Tyndall
Alfred Russel Wallace
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ROYCROFT RELIGION



MERSON says: "I like the silent church before the service begins better than any preaching." ¶ Go to the Roycroft Chapel and you have always the silent church. The noise seems to fall from one's soul as one enters there and leaves just the natural quiet.

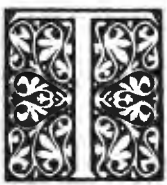
And there, there is never any preaching, but music, song, reading, repose, and sometimes the finest speech, for the man who gives himself to a thousand gives himself as freely to a hundred. You can recreate and re-create there. Moreover, where music, flowers, pictures, color, as sensuous joys, might tend to enervate the too-impressionable, the robust beauty of the little building itself helps to hold true the balance.

It is well when once in a while we fall in love with the broad beam and the resonant rafter.

Reserve some love, however, for the fireplace in the Reception Room, a real "sermon in stone." But to see it in its best beauty its heart must be full of flame. Around such a flame—how they claimed kinship then with ancient fire-worshipers!—a few of the Elect were gathered one gray evening in January, whilst one beguiled with soft music, perhaps like David of old, and exorcised an evil or an unhappy spirit.—*Yorkshire* (England) *Post.*

YOUR LIBRARY

A Little Advice To Immortals, Gratis



HESE long winter evenings are a good time to go through your library and fix it up. Catalog your books; place a label with your name in each one. Dispose of what you have outgrown, and with the proceeds buy others. Have your paper-covered books bound in stout boards, and your better ones in leather. Have all broken books and bindings repaired or re-bound. For old books yellowed by age we have a mottled brown Persian morocco that takes off the sacrilegious look of a new dress. Then we have red Turkey, a favorite binding in Europe. All should have a binding or two in pig-skin, blind-tooled, and some in white parchment with long gold lines. Then there is modeled and incised calf—the oldest and the newest binding of all—and levant that shines like one big jewel. Sets of books done in three-fourths ooze calf make very durable and artistic bindings.

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Extracts from a Few of Many Letters Urging all to Buy this Thrilling Book

"MRS. MAYBRICK'S OWN STORY"

Julia Ward Howe, Author of "The Battle Hymn of the Republic," etc.: "I am heartily glad of her deliverance from an imprisonment which I consider to have been as unjust as it was grievous, and I hope that the American public will be much interested in following her own statements of the case about to be given to the world."

Hon. William P. Frye, U. S. Senate, Washington, D. C.: "Fifteen years in prison, with entire separation from her family, under the sentence of a judge possibly incompetent, ought surely to commend her to everything our people can do in her behalf."

Rev. Newell Dwight Hillis, D. D., New York: "Years ago I read Gail Hamilton's analysis of the case against Mrs. Maybrick. Shortly afterwards I read in full the English review of the case. I made up my mind that Mrs. Maybrick was an innocent woman who has been injured to the last degree."

Margaret E. Sangster, Poet, Author and Staff Contributor to *Ladies Home Journal*, Glen Ridge, N. J.: "I have always believed in the entire innocence of Mrs. Florence E. Maybrick. I am therefore very glad that you are to publish her story, and I hope it may be widely read by Americans who should do at least this kindness, in fair play, to a countrywoman who has been grestly afflicted."

Florence Morse Kingsley, Author "Titus," "Transfiguration of Miss Philura," "The Needle's Eye," etc., Westerleigh, S. I.: "The story of her wrongs, as told by herself, deserves the widest publicity."

L. P. di Cesnola, LL. D., Director of the Metropolitan Museum of Art, New York City: "* * * I fully sympathize with Mrs. Maybrick's present position. I have always believed and I do believe today that Mrs. Maybrick was innocent of the crime for which she has suffered so long and so unjustly."

Rev. C. H. Parkhurst, D. D., LL. D., New York: "* * * The lively interest that has been felt by Americans in the heroic experience of Mrs. Maybrick, and their profound sympathy with her in the unspeakable wrong which she seems to have suffered at the hands of the English court, will render it a great privilege to be admitted into her confidence through the medium of the written story that she is preparing to give to the public."

Rev. Minot J. Savage, D. D., New York: "I think her case most pitiable. I now order from you six copies of her book in advance. I hope her countrymen will respond to this appeal so as to make her as comfortable as she can be for the rest of her life."

Marietta Holley, Author of "Samantha at the World's Fair," "My Opinion and Betsy Bobbet's," etc., etc., Pierpont Manor, N. Y.: "I have always felt a deep sympathy and pity for Mrs. Florence Maybrick, and am heartily rejoiced that she is again breathing the air of freedom."

Hon. John P. St. John, ex-Governor of Kansas, Olathe, Kan.: "After fifteen years of unjust imprisonment, loss of property and children, cold indeed is the heart that does not throb with deepest sympathy for Mrs. Maybrick."

Rev. S. Parkes Cadman, D. D., Brooklyn, N. Y.: "* * * Certainly all just men's sympathies go out toward any human creature, especially a woman, who has suffered a miscarriage of justice on such a vital issue."

Rev. Francis Nunan (Roman Catholic): "Kindly set me down as a subscriber for Mrs. Maybrick's book. * * I deeply sympathize with the writer. I am confident she has undergone untold wrongs. Governmental cruelty knows no justice—no mercy."

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TO HANDLE MEN

To Do So Successfully One Must Acquire Self-control.

A foreman in a great locomotive works tells how he acquired self-control after it had been lost through the coffee habit:

"I find myself obliged to write you about Postum Coffee," he premises. "I have been a great tea and coffee drinker for over 40 years and can say that it made me almost a total wreck. I am a night foreman in the American Locomotive Co., and have to take my dinner with me also a bottle of tea or coffee. In time it got to be so that there was not a night, for over a year, but that I would have a headache or heartburn or both. I went to the doctors almost every week to see if they could do something for me. They said it was the tobacco habit that did the mischief.

"So I gave up tobacco, but it did not help me any. I got so nervous that the men under me did not like to work for me as I could not use them as men ought to be used. I was nervous, irritable and would find fault all the time.

"Two months ago I took dinner with some friends who gave me what I supposed was a cup of coffee. They explained that it was Postum Coffee and my friend's wife said that she had used it about six months and that during that time had no headache such as she was formerly subject to, and that she felt so well all the time. That evening I took a package of Postum home with me and began using it.

"The result proved that the doctors were wrong—it was not tobacco but tea and coffee that upset me so. During the two months that I have used Postum I have had neither headache nor heartburn, my nervousness has left me and I have gained 14 pounds in weight.

"Use this if you want to, as I have got 24 families to drinking Postum instead of coffee. They saw what it had done for me." Name given by Postum Co., Battle Creek, Mich.



Copernicus

LITTLE JOURNEYS TO HOMES OF GREAT SCIENTISTS

Copernicus



WRITTEN BY ELBERT HUBBARD AND DONE INTO BOOK FORM BY THE ROYCROFTERS AT THEIR SHOP, WHICH IS IN EAST AURORA, NEW YORK, A.D. MCMV

CB

COPERNICUS

TO know the mighty works of God; to comprehend His wisdom and majesty and power; to appreciate, in degree, the wonderful working of His Laws, surely all this must be a pleasing and acceptable mode of worship to the Most High, to whom ignorance cannot be more grateful than knowledge. COPERNICUS.

COPERNICUS

WHEN a prominent member of Congress, of slightly convivial turn, went to sleep on the floor of the House of Representatives, and suddenly awakening, convulsed the assemblage by loudly demanding, "Where am I at?" he propounded an inquiry that is indisputably a classic.

With the very first glimmering of intelligence, and as far back as history goes, man has always asked that question, also three others:

Where am I?

Who am I?

What am I here for?

Where am I going?

A question implies a reply, and so, coeval with the questioner, we find a class of Volunteers springing into being, who have taken upon themselves the business of answering the interrogations.

And as partial payment for answering these questions, the man who answered has exacted a living from the man who asked, also titles, honors, gauds, jewels and obsequies. Further than this, the Volunteer who answered has declared himself exempt from all useful labor.

¶ Walt Whitman has said:

I think I could turn and live with animals, they are so placid and self-contain'd.
I stand and look at them long and long.

They do not sweat and whine about their condition,
They do not lie awake in the dark and weep for their sins,
They do not make me sick discussing their duty to God.
Not one is dissatisfied, not one is demented with the mania of owning things,
Not one kneels to another, nor to his kind that lived thousands of years ago,
Not one is respectable or unhappy over the whole earth.

But we should note this: Whitman merely wanted to live with animals, he did not desire to become one. He was n't willing to forfeit knowledge; and a part of that knowledge was that man has some things yet to learn from the patient brute.

Much of man's misery has come from his persistent questioning.

The book of Genesis is certainly right when it tells us that man's troubles came from a desire to know. The fruit of the tree of knowledge is bitter, and man's digestive apparatus has been ill-conditioned to digest it. But still we are grateful, and good men never forget that it was woman who gave the fruit to man—men learn nothing alone. In the Garden of Eden, with everything supplied, man was an animal, but when he was turned out and had to work, strive, struggle and suffer, he began to grow.

The Volunteers of the Far East have told us that man's deliverance from the evils of life must come through killing desire; we will reach Nirvana—rest—through

nothingness. But within a decade it has been borne in upon a vast number of the thinking men of the world that deliverance from discontent and sorrow was to be had not through ceasing to ask questions, but by asking one question more. The question is this, "What can I do?"

When man went to work, action removed the doubt that theory could not solve.

The rushing winds purify the air; only running water is pure; and the holy man, if there be such, is the one who loses himself in persistent, useful effort. By working for all, we secure the best results for self, and when we truly work for self, we work for all.

In that thoughtful essay by Brooks Adams, "The Law of Civilization and Decay," the author says: "Thought is one of the manifestations of human energy, and among the earlier and simpler phases of thought, two stand conspicuous—Fear and Greed. Fear, which, by stimulating the imagination, creates a belief in an invisible world, and ultimately develops a priesthood."

¶ The priestly class evolves naturally into being everywhere as man awakens and asks questions. Only the unknown is terrible, says Victor Hugo. We can cope with the known, and at the worst we can overcome the unknown by accepting it. Verestchagin, the great painter who knew the psychology of war as few have known, and went down to his death gloriously, as he should, on a sinking battle-ship, once said: "In modern warfare, when man does not see his enemy, the poetry of the battle is gone, and man is rendered by

the Unknown into a quaking coward." ¶ But enveloped in the fog of ignorance every phenomenon of nature causes man to quake and tremble—he wants to know! Fear prompts him to ask, and Greed—greed for power, place and pelf—answers.

To succeed beyond the average, is to realize a weakness in humanity and then bank on it. The priest who pacifies is as natural as the fear he seeks to assuage—as natural as man himself.

So first, man is in bondage to his fear, and this bondage he exchanges for bondage to a priest. First, he fears the unknown; second, he fears the priest who has power with the unknown.

Soon the priest becomes a slave to the answers he has conjured forth. He grows to believe what he at first pretended to know. The punishment of every liar is that he eventually believes his lies. The mind of man becomes tinted and subdued to what he works in, like the dyer's hand.

So we have the formula—Man in bondage to fear.

Man in bondage to a priest.

The priest in bondage to a creed.

Then the priest and his institution become an integral part and parcel of the state, mixed in all of its affairs. The success of the state seems to lie in holding belief intact and stilling all further questions of the people, transferring all doubts to this Volunteer Class that answers for a consideration.

Naturally, the man who does not accept the answers is regarded as the enemy of the state—that is, the

enemy of mankind. ¶ To keep this questioner down has been the problem of every religion. And the problem of progress has been to smuggle the newly-discovered truth past Cerberus, the priest, by preparing a sop that was to him palatable.

From every branch of Science the priest has been routed, save in Sociology alone. Here he has stubbornly made his last stand, and is saving himself alive by slowly accepting the situation and transforming himself into the Promoter of a Social Club.

THE attempt to ascertain the truths of physical science outside of theology, in the early ages was very seldom ventured. When men wanted to know anything about anything, they asked the priest. ¶ Questions that the priest could not answer he declared were forbidden of man to know; and when men attempted to find out for themselves they were looked upon as heretics.

The early Church regarded the earth as a flat surface with four corners. And in proof of their position they quoted St. Paul, who wanted the gospel carried to the ends of the earth. In fact, the universe was a house, The upper story was heaven, the lower story was the earth and the cellar was hell. God, the angels and the "saved" lived in heaven, man lived on earth, and the devils and the damned had hell to themselves.

"And there shall be no night there," and this was

proven by the stars which were regarded as peep-holes through which mortals could catch glimpses of the wondrous light of heaven beyond. Hell was below, as was clearly shown by volcanoes, when the fierce fires occasionally forced themselves up through. Darkness to children is always terrible, and the night is regarded by them as the time of evil.

Later, churchmen came to believe that the stars were jewels hung in the sky every night by angels whose business it was to look after them.

The word "firmament" means a solid dome or roof. This firmament, the sky, was supposed to be the floor of heaven. The firmament had four corners and rested on the mountains, as the eye could plainly see. When God's car was rolled across the floor we heard thunder, and His movements were always accompanied by lightnings, winds, black clouds and rain—all this so He could not be too plainly seen.

Heaven was only a little way off—a few miles at the most. So there were attempts made at times by bad men to reach it. The Greeks had a story about the Aloidæ who piled mountain upon mountain; the Bible story of the Tower of Babel is the same, where the masons called, "More mort," and those below sent up bricks. There is also an ancient Mexican legend of giants who built the Pyramid of Cholula, and they would have been successful in their attempts if fire had not been thrown down upon them from heaven. In all "Holy Writ" we find accounts of "ascensions," "translations," "annunciations," and mortals caught

up into clouds. Many people had actually seen angels ascending and descending.

"Messengers from on high" and God's secretaries were constantly coming down on delicate errands. Everything that man did was noted and written down. We were watched all the time by unseen beings. The Bible tells of how the earth was eventually to be destroyed, and then there would only be heaven and hell. God, His Son and the angels were going to come down, and for ages men watched the heavens to see them appear. All sensitive children, born of orthodox Christian parents, who heard the Bible read aloud, looked fearfully into the sky for "signs and wonders." The Bible tells in several places of devils breaking out of hell and roaming over the earth. Dante fully believed in this three-story-house idea, and pictures with awful exactness the details, which he gained from the preaching of the priests. Dante was never honored by having his books placed on the "Index." On the contrary he got his vogue largely through the recommendation of the priests. To them he was a true scientist for he corroborated their statements.

The Christian Fathers ridiculed the idea of the earth being round, because, if this were so, how could the people on the other side see the Son of Man when He came in the sky? Besides that, if the earth were round and turned on its axis, we should all fall off into space.

The idea that there was an ocean above the earth, in the heavens, was brought forward to show the

goodness and wisdom of God. Without this there would be no rain and hence no vegetation, and man would soon perish. In Genesis we read that God said, "Let there be a firmament in the midst of the waters, and let it divide the waters from the waters." And in Psalms, "Praise Him, ye heavens of heavens and ye waters that be above the heavens." Then we hear, "The windows of heaven were opened." So this thought of the waters above the earth was fully proved, accepted and fixed, and to pray for rain was quite a natural thing. The English Prayer Book contained such prayers up to within a very few years ago, and in 1883 the Governor of Kansas set apart a day upon which the people were to pray that God would open the windows of heaven and send them rain. They also prayed to be delivered from grasshoppers. Just as in Queen Elizabeth's time the Prayer Book had this, "From the Turk and the Comet, good Lord deliver us."

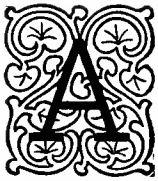
In the Sixth Century, Cosmos, one of the Saints, wrote a full and complete explanation of the phenomena of the heavens. To account for the movement of the sun, he said God had His angels push it across the firmament and put it behind a mountain each night, and the next morning it was brought out on the other side. He met every objection by citations from Genesis, Job, Ezekiel, Ecclesiastes and the New Testament, and wound up with an anathema upon any or all who doubted or questioned in this matter of astronomy.

The whole Christian idea of the Universe was simple, plain and plausible. The child-mind could easily accept

it, and when backed up by the Holy Book, written by God's dictation, word for word, infallible and absolutely true in every part, one does not wonder that progress was practically blocked for fourteen hundred years, but the real miracle is that it was not blocked forever.

THOUSANDS of years before Christ, the Chinese had mapped the heavens and knew the movements of the planets so well that they correctly prophesied the positions of the constellations years in advance. Twenty-five hundred years before our Christian era a Chinese Governor put to death the astronomers Hi and Ho because they had failed to foretell an eclipse, quite according to the excellent Celestial plan of killing the doctor when his patient dies. Sir William Hamilton points out the fact that the Chinese, five thousand years ago, knew astronomy nearly as well as we do today, and that Christian astrology grew out of Chinese astronomy, in an effort to foretell the fortunes of men. Fear wants to know the future, and astrology and priesthood are synonymous terms, since the business of the priest has always been to prophesy what was going to happen, a profession he has not even yet discarded.

Their prophecies are at present innocuous and lightly heeded. They preach that perfect faith will move a mountain, but energetic railroad builders of today find it quicker and cheaper to tunnel.



CERTAIN type of man accepts a certain theory.

The Christian view of creation was practically the conception of the Greeks before Thales. This wise man in the Sixth Century before Christ, taught that the earth was round, and that certain stars were also worlds. He showed that the earth was round and proved it by the disappearance of the ship as it sailed away. He located the earth, moon and sun so perfectly that he prophesied an eclipse, and when it took place it so terrified the Medes and Lydians, who were in battle against each other, that they threw down their arms and made peace. Thales explained that Atlas carried the world on his shoulder, but he did n't explain what Atlas stood upon.

Pythagoras, one of the pupils of Thales, following the idea still further, showed that the moon derived its light from the sun, that the earth was a globe and turned daily on its axis. He held that the sun was the center of the universe and that the planets revolved around it. Anaxagoras followed a few years after Pythagoras, and became convinced that the sun was merely a ball of fire and therefore should not be worshiped; that it follows a natural law, that nothing happens by chance and that to pray for rain is absurd.

For his sterling honesty in expressing what he thought was truth, the priests of Athens had Anaxagoras and his family exiled to perpetual banishment from Athens and all of his books were burned.

Plato touched on astronomy, for he touches on everything, and fully believed that the earth was round. His pupil, Aristotle, taught all that Anaxagoras taught, and if he had not also been exiled, but had been free to study, investigate and express himself, he would have come very close to the truth. Hipparchus, a hundred years after Aristotle, calculated the length of the year to within six minutes, discovered the precession of the equinoxes and counted all the stars he could see, making a map of them.

Seventy years after Christ, Ptolemy, a Græco-Egyptian, but not of the royal line of Ptolemys, published his great book, "The Almagest." For fourteen centuries it was the text-book for the best astronomers. It taught that the earth was the center of the universe, and that the sun and the planets revolve around it. There were many absurdities, however, that had to be explained, and the priests practically rejected the whole book as "pagan" and taught an astronomy of their own, founded on the Bible. What they wanted was an explanation that would be accepted by the common people. This astronomy was not designed to be scientific, exact, or truthful—all they asked was, "Is it plausible?" Expediency, to theology, has always been much more important than truth.

"Besides," said St. Basil, "what boots it concerning all this conjecture about the stars, since the earth is soon to come to an end, as shown by our Holy Scriptures, and man's business is to prepare his soul for eternity?"

This was the general attitude of the Church—exact truth was a matter of indifference. And if science tended to unseat men's faith in the Bible, and in God's holy religion, then so much worse for the science.

It will thus plainly be seen why the Church felt compelled to fight science—the very life of the Church was at stake. The Church was the vital thing—not truth. If truth could be taught without unseating faith, why, all right, but anything that made men doubt must be rooted out at any cost. And that is why priests have opposed Science, not that they hate Science less, but that they love the Church more.

From the time of Ptolemy to that of Copernicus—fourteen hundred years—theology practically dictated the learning of the world. And to Copernicus must be given the credit of having awakened the science of astronomy from her long sleep.



THE little land that we know as Poland has produced some of the finest and most acute intellects the world has ever known. Tragic and blood-stained is her history, and this tragedy, perhaps, has been a prime factor in the evolution of her men of worth. Poland has been stamped upon and pushed apart; and a persecuted people always produce a pride of race that has its outcrop in occasional genius.

Recently we have heard of Paderewski playing before the Czar, and His Majesty, in a speech meant to

be complimentary, congratulated the company that so great a genius was a citizen of Russia.

"Your Majesty, I am not a Russian—I am a Pole!" was the proud reply.

The Czar answered, with a smile, "There is no such country as Poland—now there is only Russia!"

And Paderewski replied, "Pardon my hasty remark—you speak but truth." And then he played Chopin's Funeral March, a dirge not only to the great men of Poland gone, but to Poland herself.

Nicholas Copernicus was born of Polish parents in the quaint old town of Thorn, February 19, 1473. The family name was Koppernig, but Nicholas Latinized it when he became of age, and seemingly separated from his immediate kinsmen forever.

His father was a merchant, fairly prosperous, and ambitious only in the line of money-making. In the Koppernigs ran a goodly strain of Jewish blood, but a generation before, pressure and expediency seemed to combine, so that the family, as we first find them, were Christians. No soil can grow genius, no seed can produce it—it springs into being in spite of all laws and rules and regulations. "No hovel is safe from it," says Whistler.

The portraits of Copernicus reveal a man of most marked personality—proud, handsome, self-contained, intellectual. The head is massive, eyes full, luminous, wide apart, nose large and bold, chin strong, the mouth alone revealing a trace of the feminine—as though the man were the child of his mother. This

mother had a brother who was a bishop, and the mother's ambition for her boy was that he should eventually walk in the footsteps of this illustrious brother who was known for a hundred miles as a preacher of marked ability.

So we hear of the young man being sent to the University of Cracow, as preliminary to a great career. The father opposed the idea of taking the son out of the practical world of business, and this evidently led to the breach that caused young Nicholas to discard the family name.

That Nicholas did not fully enter into his mother's plans is shown that while at Cracow he devoted himself mostly to medicine. He was so proficient in this that he secured a physician's degree; and having been given leave to practice he revealed his humanity by declining to do so, turning to mathematics with a fine frenzy.

This disposition to drop on a thing—turn loose on it—concentrate, and reduce it to chaos, is the true distinguishing mark of genius. The difference in men does not lie in the size of their heads, nor the perfection of their bodies, but in this one sublime ability of concentration—to throw the weight with the blow, live an eternity in an hour—"This one thing I do!"

Copernicus at twenty-one was teaching mathematics at Cracow, and by his extraordinary ability in this direction had attracted the attention of various learned men. In fact the authorities at the college had grown a bit boastful of their star student, and when visiting

dignitaries arrived, young Copernicus was given chalk and blackboard and put through his paces. Problems involving a dozen figures and many fractions were worked out by him with a directness and precision that made him the wonder of that particular part of the world.

Copernicus invented the science of trigonometry, and we see that early in his twenties he was well on the heels of it, for he had arranged a quadrant to measure the height of standing trees, steeples, buildings or mountains. For rest and recreation he painted pictures.

¶ A college professor from Bologna traveling through Cracow, met Copernicus, and greatly impressed with his powers, invited him to return with him to Bologna and there give a course of lectures on mathematics.

¶ Copernicus accepted, and at Bologna met the astronomer, Novarra. Copernicus was then twenty-three years of age, but in intellect he was a man. He had vowed a year before that he would indulge in no trivial conversation about either persons or things, only great and noble themes should interest him or occupy his attention. With ignorant or commonplace people he held no converse. He had remarkable beauty of person and great dignity, and his presence at Bologna won for him immediate respect.

Men accept other men at the estimate they place upon themselves.

In listening to lectures by Novarra, he perceived at once how mathematics could be made valuable in calculating the movements of the stars.

Novarra taught the Ptolemaic theory of astronomy for the esoteric few. The Church is made up of men, and while priests for the most part are quite content to believe what the Church teaches, yet it has ever been recognized that there was one doctrine for the Few, and another for the Many—the esoteric and the exoteric. The esoteric is an edged tool, and only a very few are fit to handle it. The charge of heresy is only for those who are so foolish as to give out these edged tools to the people. You may talk about anything you want, provided you do not do it, and you may do anything you want, provided you do not talk about it.

The proposition that the earth was flat, had four corners, and the stars were jewels hung in the sky as "signs," and were moved about by angels, was all right for the many, but now and then there were priests who were not content with these child-stories—they wanted truth—and these usually accepted the theories of Ptolemy.

Novarra believed that the earth was a globe; that this globe was the center of the universe, and that around the earth the sun, moon and certain stars revolved. The "fixed" stars he still regarded as being hung against the firmament, and that this firmament was turned in some mysterious way, en masse.

Copernicus listened silently, but his heart beat fast. He had found something upon which he could exercise his mathematics. He and Novarra sat up all night in the belfry of the cathedral and watched the stars. They saw that they moved steadily, surely and with-

out caprice. It was all natural, and could be reduced, Copernicus thought, to a mathematical system.

Astronomy and astrology were not then divorced. It was astrology that gave us astronomy. The angel that watched over a star looked after all persons who were born under that star's influence, or else appointed some other angel for the purpose. Every person had a guardian angel to protect him from the evil spirits that occasionally broke out of hell and came up to earth to tempt men.

Mathematics knows nothing of angels—it only knows what it can prove. Copernicus believed that if certain stars moved, they moved by some unalterable law of their own. In riding on a boat he observed that the shores seemed to be moving past, and he concluded that a part, at least, of the seeming movements of the planets might possibly be caused by the moving of the earth ❧ ❧

In talking with astrologers he perceived that very seldom did they know anything of mathematics. And this ignorance on their part caused him to doubt them entirely. His faith was in mathematics—the thing that could be proved, and he came to the conclusion that astronomy and mathematics were one thing, and astrology and child-stories another.

He remained at Bologna long enough to turn the astrologers out of the society of astronomers.

Novarra's lectures on astronomy were given in Latin, and in truth all learning was locked up in this tongue. But astrology and the theological fairy tales of the

people floated free. They were a part of the vagrant hagiology of the roadside preachers, who with lurid imaginations said the things they thought would help carry conviction home and make "believers."

From Bologna Copernicus moved on to Padua, where he remained two years, teaching and giving lectures. Here he devoted considerable time to chemistry, and on leaving he was honored by being given a degree by the University. Next we find him at Rome filling a professor's chair of mathematics and also giving lectures on chemistry. His lectures were not for the populace—they were for the learned few. But they attracted the attention of the best, and were commented upon and quoted by various other teachers, preachers and lecturers. A daring thinker who expresses himself without reservation, states the things that various others know and would like to state if they dared. It is often very convenient when you want a thing said to enclose the matter in quotation marks. It relieves one from the responsibility of standing sponsor for it, if the hypothesis does not prove popular.

Copernicus was nineteen years old when Columbus discovered America, but it seems he did not hear of Columbus until he reached Bologna in 1495. At Rome he made various references to Columbus in his lectures, dwelt upon the truth that the earth was a globe; mentioned the obvious fact that in sailing westward Columbus did not sail his ship over the edge of the earth into hell, as had been prophesied he would. He also explained that the red sky at sunset was not

caused by the reflections from hell, nor was the sun moved behind a mountain by giant angels at night. Copernicus was a Catholic, as all teachers were, but he had been deceived by the esoteric and the exoteric, and had really thought that the priests and so-called educated men actually desired, for themselves, to know the truth.

At Padua he had learned to read Greek, and had become more or less familiar with Pythagoras, Hipparchus, Plato and Aristotle. He quoted these authors and showed how in some ways they were beyond the present. This was all done in the exuberance of youth, with never a doubt as to the value and the beauty of the Church. But he was thinking more of truth than of the Church, and when a cardinal from the Vatican came to him, and in all kindness cautioned him, and in love explained it was all right for a man to believe what he wished, but to teach others the things that were not authorized, was a mistake.

Copernicus was abashed, depressed. He saw then that his lectures had really been for himself—he was endeavoring to make things plain to Copernicus, and the welfare of the Church had been forgotten.

He ceased lecturing for a time, but private pupils came to him and among them were astrologers in disguise, and these went away and told broadcast that Copernicus was teaching that the movements of the stars were not caused by angels, and that "God was being dethroned by a tape measure and a yardstick."

Alchemy had a strong hold upon the popular mind,

and these alchemists and astrologers were fortune-tellers and derived a goodly income from the people. They had their stands in front of all the churches and turned in a goodly tithe "for the benefit of the poor."

¶ When the astrologers attacked Copernicus he tried to explain that the heavens were under the reign of natural law, and that so far as he knew there was no direct relationship between the stars and the men upon earth. The answer was, "You yourself foretell the eclipse and you assume to know when a star will be in a certain place a hundred years in advance, now if you can prophesy about stars why can't we foretell a man's future?"

Copernicus proudly declined to answer such ignorance, but went on to say alchemy was a violence to chemistry as much as astrology was to astronomy. In chemistry there were exact results that could be computed by mathematics and foretold—it was likewise so in astronomy. Copernicus was philosopher enough to perceive that astrology led to astronomy, and alchemy led to chemistry, but he said all he wished to do was to eliminate error and find the truth, and when we have ascertained the laws of God in reference to these things we should discard the use of black cats, goggles, peaked hats, red fire and incantations—these things were sacrilege. And the enemy declared that Copernicus was guilty of heresy in saying they were guilty of sacrilege. Moreover, black cats were not as bad as blackboards.

The Pope certainly had no idea of treating Copernicus

harshly—in fact, he greatly admired him, but peace was the thing desired. Copernicus was creating a schism, and there was danger that the revenues would be affected. The Pope sent for Copernicus, received him with honors, blessed him, and suggested that he return at once to his native town of Thorn and there await good news that would come to him soon.

The young man was overwhelmed with gratitude—he was in difficulties. Certain priests had publicly denounced him; others had urged him on to unseemliness in debate; he had stated things he could not prove, even though he knew they were true—but the Pope was his friend!

He loved the Church—he felt how necessary it was to the people, and at the last, the desire of his heart was to bless and benefit the world. He fell on his knees and attempted to kiss the Pope's foot, but instead the Holy Father offered him his hand, smiled on him, stroked his head, and an attendant was ordered to place about his neck a chain of gold with a crucifix that would protect him from all harm. A purse was placed in his hand, and he was sent upon his way relieved, happy —wondering, wondering!



WHEN Copernicus reached his native town of Thorn the local clergy turned out to greet him in a procession, and a solemn service of thanksgiving was held for his safe return.

Copernicus was only twenty-seven years of age, and what he had done was not quite clear to his uncle, the bishop, and the other dignitaries, but word had come from the secretary of the Pope that he should be honored, and it was all so done, in faith, love and enthusiasm.

Very shortly after this, Copernicus was made Canon of the Cathedral at Frauenburg. The town of Frauenburg has now only about twenty-five hundred people, and it certainly was no larger then. The place is slow, sleepy, and quite off the beaten track of travel. When Canon Copernicus preached now it was to a dear, stupid lot of old market-women, and overworked men and mischievous children. Oratory is a collaboration—let him wax eloquent about the precession of the equinoxes, and prate of Plato and Pythagoras if he wished—no one could understand him!

Rome is wise—the crystallized experience of centuries is hers. Responsibility tames a man—marriage, political office, churchly preferment—read history and note how these things have dulled the bright blade of revolution and turned the radical into a Presbyterian professor at Princeton, a staunch upholder of the Established Order!

Plato said that Solar Energy found one of its forms of

expression in man. Some men are much more highly charged with it than others; your genius is a man who does things. Do not think to dam up the red current of his life—he may die.

Copernicus set to work practicing medicine, and gave his services gratis to the poor, who came from many miles to consult him. He went from house to house and ordered his people to clean up their back yards, to ventilate their houses—to bathe and be decent and orderly. He devised a system of sewerage, and utilized the belfry of his church as a water-tower, to get a water pressure from the little stream that ran near the town. The remains of this invention are to be seen there in the church steeple even unto this day.

King Sigismund of Poland had heard of the attacks made by Copernicus upon the alchemists, and sent for him that he might profit by his advice, for it seems that the King, too, had been having experience with alchemists. In their seeking after a way to make gold out of the baser metals they had actually succeeded—yes! At least they said so, and had made the King believe it.

They had shown the King how he could cheapen his coinage one-half, and "it was just as good!" The King could not tell the difference when the coins were new, but alas! when they went beyond the borders of Poland they could only be passed at half their face value; travelers refused to accept them; and even the merchants at home were getting afraid.

Copernicus analyzed some of this money made for the

King by his alchemist friends and found a large alloy of tin, copper and zinc. He explained to the King that by mixing the metals they did not change their nature nor value. Gold was gold, and copper was copper—God had made these things and hid them in the earth and men might deceive some men—a part of the time—but there was always a retribution. Debase your currency, and soon it will cease to pass current.

No law can long uphold a factitious value.

The King urged Copernicus to write a book on the subject of coinage. The permission of the Pope was secured, and the book written. The work is valuable yet, and reveals a deep insight into the heart of things. The man knew political economy, and foretold that a people who debased their currency debased themselves. "Money is character," he said, "and if you pretend it is one thing, and it turns out to be another, you lose your reputation and your own self-respect. No government can afford to deceive the governed. If the people lose confidence in their rulers, a new government will spring into being, built upon the ruins of the old. Government and commerce are built on confidence."

Then he went on to show that German gold was valuable everywhere, because it was pure, but Polish gold and Russian gold were below par because the money had been tampered with, and as no secrets could be kept long, the result was, the matter exactly equalized itself, save that Russians and Polanders had in a degree lost their characters through belief in miracles.

Copernicus advocated a universal coinage, to be

adopted by all civilized nations, and the amount of alloy should be known and plainly stated, and this alloy should simply be the seigniorage, or what was taken out to cover the cost of mintage.

King Sigismund circulated this book by Copernicus among all the courts of Europe, and it need not be stated that the suggestions made by Copernicus have been adopted by all civilized nations.

THE humdrum duties of a country clergyman did not still the longing of Copernicus to know and understand the truth. He visited the sick, closed the eyes of the dying, kept his parish register, but his heart was in mathematics, and so there is shown at Thorn an old church register kept by Copernicus, where, in the back, are great rows of figures put down by the Master as he worked at some astronomical problem. In the upper floor of the barn, back of the old dilapidated farmhouse where he lived for forty years, he cut holes in the roof, and also apertures in the sides of the building through which he watched the movements of the stars. He lived in practical isolation and exile, for the Church had forbidden him to speak in public excepting upon themes that the Holy Fathers in their wisdom had authorized. None were to invite him to speak, read his writings or hold converse with him, excepting on strictly church matters.

Copernicus knew the situation—he was a watched

man. For him there was no preferment—he knew too much! As long as he kept near home and did his priestly work all was well, but a trace of ambition or heresy, and he would be dealt with. The Universities and all prominent churchmen were secretly ordered to leave Copernicus and his vagaries severely alone. ¶ But the stars were his companions—they came out for him nightly and moved in majesty across the sky. "They do me great honor," he said. "I am forbidden to converse with great men, but God has ordered for me a procession." When the whole town slept Copernicus watched the heavens, and made minute records of his observations. He had brought with him from Rome copies made by himself from the works of the prominent Greek astronomers, and the "Almagest" of Ptolemy he knew by heart.

He digested all that had been written on the subject of astronomy; slowly and patiently he tested every hypothesis with his rude and improvised instruments. "Surely God will not damn me for wanting to know the truth about His glorious works," he used to say. ¶ Emerson once wrote this, "If the stars came out but once in a thousand years, how men would adore!" But before he had written this, Copernicus had said, "To look up at the sky, and behold the wondrous works of God, must make a man bow his head and heart in silence. I have thought, and studied, and worked for years, and I know so little—all I can do is to adore when I behold this unfailing regularity, this miraculous balance and perfect adaptation. The majesty

of it all humbles me into the dust." ¶ It was ostracism and exile that gave Copernicus the leisure to pursue his studies in quiet—undiverted, undisturbed. He was relieved from financial pinch, having all he needed for his simple, homely wants. The mental distance that separated him from his parishioners made him free, and the order that he should not travel and that none should visit him made him master of his time. There were no interruptions—" God has set me apart," he wrote, " that I may study and make plain His works." But still that he could not make his discoveries known was a constant, bitter disappointment to him.

Astronomy afforded him a means of using his mighty mathematical genius for his own pleasure and amusement. In seeking to subdue him, the Pope had merely supplied the exact conditions he required to do his work—yet neither knew it. So mighty is Destiny—we work for one thing and fail to get it, but in our efforts we find something better.

The simple, hard-working gardeners with whom Copernicus lived, had a reverent awe for the great man; they guessed his worth, but still had suspicions of his sanity. His nightly vigils they took for a sort of religious ecstasy, and a wholesome fear made them quite willing not to do anything that might disturb him.

So passed the days, and from a light-hearted, ambitious man, Copernicus had grown old and bowed, and nearly blind from continuously watching the stars and writing at night.

But his book, "The Revolution of the Heavenly Bodies," was at last complete. For forty years he had worked at it, and for twenty-seven years, he himself says, not a day or a night had passed without his having added something to it.

He felt that he had in this book told the truth. If men wanted to know the facts about the heavens they would find them here. He had approached the subject with no preconceived ideas; he had ever been willing to renounce a theory when he had found it wrong. He knew what all other great astronomers had taught, and out of them all he had built a Science of Astronomy that he knew would stand secure.

But what should he do with all this mass of truth he had discovered? It was in his own brain, and it was in the three thousand pages of this book, which had been re-written five times. In a few years at most his brain would be stilled in death; and in five minutes, ignorance and malice might reduce the book to ashes, and the forty years' labor of Copernicus—working, dreaming, calculating, weeping, praying—would all go for naught and be but as a tale that is told. Others might have lived such lives and known as much as he, and all was lost!

To frankly send the book to Rome and ask the Censor for the privilege to publish it, was out of the question—the request would be refused, the manuscript destroyed, and his own life even might be in danger.

To publish it at home without the consent of his Bishop would be equally dangerous. There would be a

bonfire of every copy in the public square, for in this volume, all the priests taught of astronomy had been contradicted and refuted.

And then it occurred to him to send the manuscript to the free city of Nuremberg, the home of science, art and free speech, where men could print what they thought was truth—Nuremberg, the home of Albrecht Durer. With the book he sent a bag of gold, his savings of a lifetime, to pay the expense of printing the volume and putting it before the world.

To better protect himself, Copernicus wrote a preface, dedicating the book to the Pope Paul, thus throwing himself upon the mercy of His Holiness. He would not put the work out anonymously, as his friends in Nuremberg, for his own safety, had advised. Neither would he flee to Nuremberg for protection; he would stay at home—he was too old to travel now—besides he had forgotten how to talk and act with men of talent.

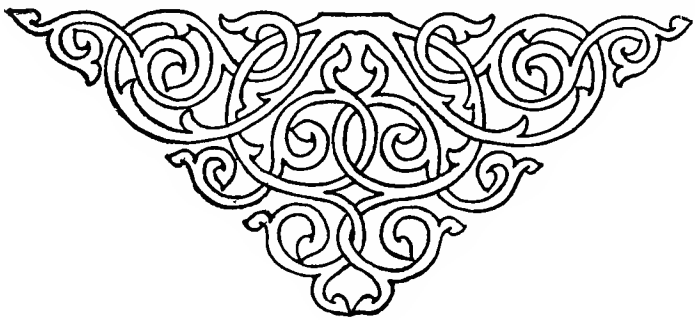
¶ How would Rome receive the book! He could only guess—he could only guess.

The months went by, and fear, anxiety, and suspense had their sway. He was stricken with fever. In his delirium he called aloud, "The book—tell me—they surely have not burned it—you know I wrote no word but truth—oh, how could they burn my book!"

But on May 23, 1543, a messenger arrived from Nuremberg. He carried a copy of the printed book—he was admitted to the sick-room, and placed in the hands of the stricken man the volume. A gleam of sanity came to Copernicus. He smiled, and taking the book gazed

upon it, stroked its cover as though caressing it, opened it and turned the leaves. Then closing the volume and holding it to his heart, he closed his eyes, and sank to sleep, to awake no more.

His body was buried with simple village honors, and laid to rest beneath the floor of the Cathedral where he had so long ministered, side by side with a long line of priests. On the little slab that marked his resting-place no mention was made of the mighty work he had done for truth. There were fears that when the character of his book was known, the grave of Copernicus would not remain undisturbed, and so the inscription was simply this: "I ask not the grace accorded to Paul; not that given to Peter; give me only the favor which Thou didst show to the thief on the cross."

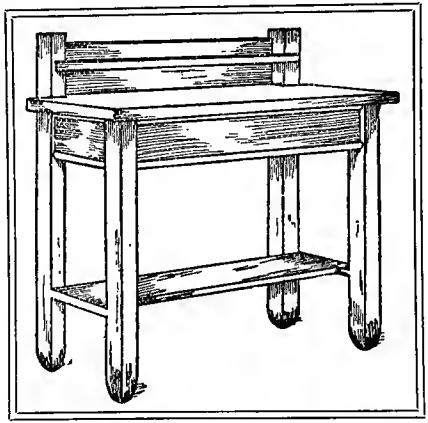


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He gave his check calling for $1540 for a set of 12 Heppelwhite chairs, $255 for a drop-front desk, $440 for a Hogarth chair settee, $265 for a Chippendale lowboy, $260 for a Colonial sofa and $300 for six Colonial chairs. New England was represented also by Gov. Bulkeley of Connecticut, who gave $2400 for the pair of Jefferson tables and $740 for a pair of Sheraton knife urns. James Breese paid $1020 for six Chippendale chairs originally owned by Lord Fairfax of Virginia, $285 for six mahogany chairs, $410 for a snap table and $105 for a high-post bed. The total for the session was $27,867.00.—*Boston Transcript*, Dec. 20, 1904.

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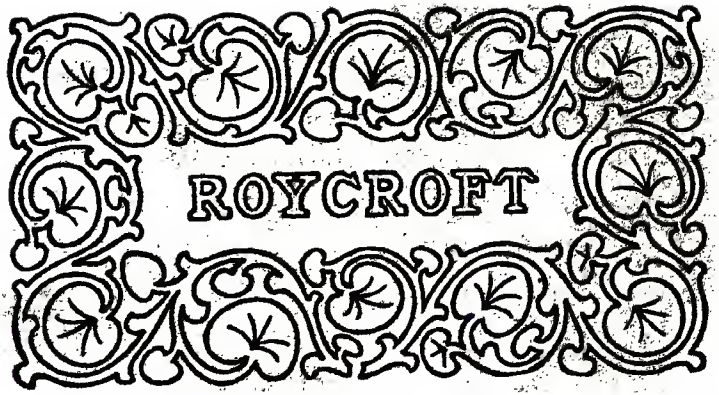
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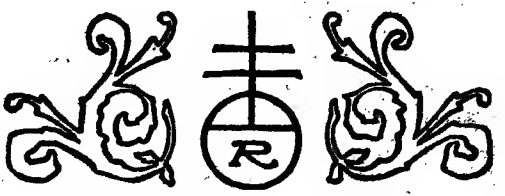
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Galileo

LITTLE JOURNEYS TO HOMES OF GREAT SCIENTISTS

Galileo



WRITTEN BY ELBERT HUBBARD AND DONE INTO BOOK FORM BY THE ROYCROFTERS AT THEIR SHOP, WHICH IS IN EAST AURORA, NEW YORK, A.D. MCMV

G A L I L E O

I AM inclined to believe that the intention of the Sacred Scriptures is to give to mankind the information necessary for their Salvation.

But I do not hold it necessary to believe that the same God who has endowed us with senses, with speech, with intellect, intended that we should neglect the use of these, and seek by other means for knowledge which these are sufficient to procure us; especially in a science like astronomy, of which so little notice is taken by the Scriptures, that none of the planets, excepting the sun and moon and once or twice only Venus, by the name of Lucifer, are so much as named at all.

This therefore being granted, methinks that in the discussion of natural problems we ought not to begin at the authority of texts of Scripture but at sensible experiments and necessary demonstrations.

GALILEO.

GALILEO

WITH the history of Copernicus and Galileo there is connected a man of such stern and striking individuality that the story of the evolution of astronomy cannot be told and this man's name left out. Giordano Bruno was born in 1548. His parents were obscure people, and his childhood and early education are enveloped in mystery. Occasional passages in his writings refer to his sympathy for outcast children, and he quotes the saying of Jesus, "Suffer little children to come unto me, and forbid them not, for of such is the Kingdom of Heaven." He then refers to himself as having been a waif and robbed of the love that was his due, "the lawful, legal heritage of every child, sent without its consent into a world of struggle and strife, where only love makes existence possible."

Evidently the early life of Bruno was a symbol and shadow of what fate held in store for him.

The first authentic knowledge we have of Bruno was when he was twenty-two years old. He was then a Dominican monk, and he is brought to our attention because he distinguished himself by in-

curring the displeasure of his superiors. His particular offense was that he had declared, "The infallibility of the Pope is only in matters spiritual, and does not apply to the science of material things."

Strangely enough these words of Bruno are almost identical with words recently expressed by Cardinal Satolli. The difference in their reception is owing to a mere matter of a few hundred years. Truth is a question of time and place. Bruno was banished for his temerity, and Satolli wears the red hat. Verily the heresy of yesterday is the orthodoxy of to-day.

THE Churchly attitude toward the teaching of Copernicus, after the death of the man, was one of patronizing pity. Instead of putting his book, "Revolutions of the Heavenly Bodies" on the Index, the wiser plan was adopted of paying no attention to it. Occasionally, however, the subject was broached by some incautious novitiate and then the custom was to treat the Copernican Theory as a mere hypothesis, and its author as a mental defective.

Bruno would not have it so. To him it was a very important matter whether the sun revolved around the earth as the priests taught, or the earth revolved around the sun as set forth in the work of Copernicus. He came to the conclusion that Copernicus was right, and said so. It was ordered that he should cease lecturing on astronomy and apply himself to spiritual matters.

He argued that he should be allowed to think and speak what he pleased about the stars, since the whole matter was one of opinion, and even the Pope did not know, positively, the final facts of astronomy, and if the Copernican Theory was a hypothesis, so also was the Ptolemaic Theory, held by the Church.

It will be seen that Bruno and Copernicus were very different in temperament—one was gentle, diplomatic, cautious; the other was headstrong, firm and full of argument.

Bruno was given his choice—to cease the study of astronomy or lay aside the frock of the Dominicans.

¶ The hardihood of the young man was seen in that he unfrocked himself, thinking that once outside of the order he was not responsible to a superior and could teach what he pleased, so long as it was not "heresy."

¶ Heresy is treason to the Church, but Bruno could not see how spiritual dogma could cover the facts of Physical Science, since new facts were constantly being discovered, and the material universe could only be understood by being studied. He was too innocent to comprehend that a vast majority of the people believed that popes, cardinals and priests knew everything, and that when any branch of knowledge was questioned it placed the priests in doubt. Certainly the Church has not opposed Science—she has only opposed heresy. But the curious fact is that advancing Science has usually been to the Church heretical.

When Bruno opposed anything that the priests taught he opposed the Church.

He was warned to leave Rome—his life was in danger. ¶ He fled to Geneva, the home of Calvin.

Here he thought, surely, he could speak and write as he chose.

But alas! Protestantism cared even less about Science than did the monks, and "heresy" to John Calvin was quite as serious a matter as it was to Calvin's competitor, the Pope of Rome.

The Protestants of Geneva gave Bruno scant attention—they had never heard of Copernicus, and the movements of the stars were as nothing to them, since the world was soon to come to an end. The learned men were even then making mathematical calculations, based on the prophecies of the Old Testament as to how soon the general destruction would take place. ¶ Bruno sought to argue them out of their childishness, with the result that he got himself marked as an infidel and a dangerous man.

From Geneva he went to Lyons, then to Paris, where his personality made itself felt and he was given a hearing at the University. Here he remained for several years, when he went to England, arriving there in 1584, the same year that a rustic by the name of William Shakespeare, from Stratford, reached London. Whether they ever met is doubtful.

Bruno spoke five languages and his polite accomplishments afforded him an immediate entry into the best circles of society. He was entertained at the home of Sir Philip Sidney, and afterward carried on quite a correspondence with this prince of gentlemen. Gre-

ville presented Bruno to Queen Elizabeth, who invited him to lecture at the Court on his favorite theme. This he did, and it is quite probable that the noble lords and ladies left "calls" so they could be awakened when the lecture was over and congratulate the speaker of the evening on his effort.

At Oxford there were disputations where Bruno's faultless Latin impressed the pedants much more than did his argument, so they offered him a position as Professor of Languages, but this he smilingly declined, excusing himself on the grounds that he had important business on the Continent—and he had. Already they were collecting fagots for his benefit.

He returned to Paris and began his lecturing on Science. His arguments had convinced one person, at least, and that was himself, that as the Church knew nothing of physical Science, why, possibly it stood in a like position regarding spiritual truth. That is to say, the so-called "sacred truths" were mere assumptions piled up to satisfy the people, and the ignorance and superstition of the many marked high water for the teaching of the priests. The business of the Church was to satisfy the people, and not enlighten them, for if the people became enlightened enough they would see that they did not need the Church, and then where were the honors and the riches and the red hats!

Bruno cleared his mind of its cobwebs by expression, just as we all do—that is what expression is for.

The people really dictate to the priests what they shall teach; moreover, the people absolutely refuse to

listen to anything in which they do not believe, and decline to pay for preaching that is not done to their own dictation. The business then of the Church is to study carefully the ignorance of the people and conform to it. On this one thing does its stability depend. Therefore it must as a matter of self-preservation suppress any chance intellect that is ahead of its time, lest this man honeycomb the whole structure of Churchly dogma.

Bruno said that just as the world seemed to stand still and the stars move around us, so did the Church seem to most people a fixed fact. But exactly the opposite was true—the Church moves as the people move, and unless men outside of the Church educate the people, or the people educate themselves, they will forever remain in darkness.

Bruno offered to publicly debate the question with the Bishop of Paris. That worthy was no match for Bruno in point of oratory, but when we cannot answer a man's reasons, all is not lost, for we can at least call him vile names, and this is often quite as effectual as logic.

The Bishop launched a fusillade of theological lyddite at Bruno, declaring that any Churchman who would so much as hold converse with such a wretch was disgraced forever, and that the propositions Bruno wished to argue were unthinkable to a self-respecting man. He declared that it was only the mercy of God that kept the lightning from striking Bruno dead as he wrote his heresies.

Matters were getting strained and the authorities, fearing insurrection, acted upon the advice of the good Bishop and expelled Bruno from France.

He went to Wittenberg, in his innocence, intending to tack on the church door there his theses. But Wittenberg had no use for Bruno—he believed too much, or too little, Luther could not tell which.

The University at Zurich now offered to let the exile come there and teach what he wished. Thither he journeyed and there his restless mind seemed for the first time to find a home. His writings were slowly making head, and around him there clustered a goodly group of students who believed in him and loved him.

¶ In the midst of this oasis in a troubled life, word came from some of the old-time friends he had known in Rome. They were now in Venice, and wished to have him come there and lecture. Bruno thought that his little leaven was leavening the whole lump—he was not without ambition—he was flattered by the invitation ❧ ❧

He accepted it and went to Venice.

It was simply a ruse to get the man within striking distance. Very soon after his arrival in Venice he was arrested by agents of the Inquisition and secretly taken to Rome ❧ ❧

He was lodged in a dungeon of the Castle Saint Angelo. Just what his experience was there we cannot say—the horrors of it all are not ours, for no friend of Bruno's was allowed to approach, and what he there wrote was destroyed. We do know, however, that he

was asked to recant, and we know he refused. We also know that he repeated his heresies and hurled back into the teeth of his accusers the invective they heaped upon him.

Bribery, persuasion, threat and torture were tried in turn, but all in vain, for Bruno would not swerve. Unlike Savonarola his quivering flesh could not wring from his heart an apology. He scorned the rack and thumbscrew, declaring they could not reach his soul. He knew that death would be the end—he prayed for it, and even thought to hasten it by an aggravating manner and harshness of speech toward his captors, seemingly quite unnecessary.

For seven years he was in prison. He was burned alive on February 7, 1600, aged fifty-two. When bound to the stake he turned his face from the crucifix that was held before him, and sought to kiss the fagots. His ashes were thrown to the four winds.

IN the year 1564 Galileo Galilei was born, consequently he was thirty-six years old when Bruno was executed. He had known Bruno, attended many of his lectures, and had followed his career with interest; and while he agreed with him as to the Copernican theory of the earth's revolution, he took exceptions to Bruno's arbitrary way of presenting the matter, and to his scathing criticisms of Theology. At this time Galileo could not see that the extravagant words

of Bruno were largely forced from him by the violence of the opposition he had encountered. Galileo fully believed that Bruno had been put to death for treason to the Church, and not on account of his astronomical teachings

These men had come up from totally different stations in life. Bruno was a man of the people—a self-made man—who bore upon his person the marks of the hammer. Galileo was of noble blood, and traced an ancestry to a Gonfalonier of Florence. From early infancy he had enjoyed association with polite persons, and had sat on the knees of greatness.

When eighteen he graduated from the University of Pisa; and at that early age his family and friends were comparing him, not without reason, to a Genius who had come out of Tuscany some years before, Leonardo da Vinci

Parents either exaggerate the talents of their children or else belittle them. The woman who bore George Gordon called him "that lame brat;" but we call him "The Poet Byron." Benjamin Franklin ran away from home, and his family thought themselves disgraced by his printed utterances. The mother of George Washington, on being told that her son had been made Commander in Chief, laughed knowingly, and said, "They don't know him as well as I do!" Voltaire's father posted his son as irresponsible, tied up a legacy so "the scapegrace could not waste it," invested good money in daily prayers to be said for the scapegrace's salvation, and then died of a broken heart, just as play-

actors do on the stage, only this man died sure enough. Alfred Tennyson at thirteen wrote a poem addressed to his grandfather; the old gentleman gave him a guinea for it, and then wrote these words: "This is the first and last penny you will ever receive for writing poetry." The father of Shelley misquoted Job, and said, "Oh, to be brought down to the grave in grief through the follies of an ungrateful child!" And Labouchere says that one of the four brothers of Shakespeare used to explain that he was n't the play-actor who wrote "Hamlet" and "Othello" lest, mayhap, his name should be smirched.

Galileo's mother had that beautiful dream which I believe all good mothers have—that her son might be the Savior of the world. As he grew to manhood, her faith in him did not relax.

Even in childhood Galileo showed great skill in invention. He made curious toys with cogs and wheels and eccentrics; whittled out violins, and transformed simple reeds into lutes, upon which he played music of his own composition. In fact, so great was his skill in music that at twenty they wished to make him official organist and choir-master of the Cathedral. His personal taste, however, ran more to painting, and for some months he worked at his canvases with an ardor too great to last long. If ever a man was touched by the Spirit of the Renaissance, it was young Galileo. "Upon him has fallen the mantle of Michæl Angelo," the Archbishop of Pisa said. He gave lectures on Art, and taught Painting by actual example. One of his

pupils, a great artist, Lodovico Cigoli, always maintained that it was to the inspiration and counsel of Galileo that he owed his success.

There are really only two things to see at Pisa; one is the Leaning Tower, from which Galileo with line and plummet made some of his most interesting experiments; and the other is the Cathedral where the visitor beholds the great bronze lamp that is suspended from the vaulted ceiling. When he was twenty-one, sitting in the silence of this beautiful church (which the passing years have only made more beautiful), he noticed that there was a slight swinging motion to this lamp: it was never still. Galileo set to work timing and measuring these oscillations, and found that they were always done in exact measure and in perfect rhythm. This led, some years later, to the perfecting of an astronomical clock for measuring the movements of the stars. And from this we got the pendulum clock, where before we had depended on sun-dials.

The endeavor of Galileo's parents had been to keep him ignorant of mathematics and practical life, that he might blossom forth as a saint who would sing and play and make pictures like those of Leonardo, and carve statues like Michæl Angelo, only better.

But parents plan, and fate disposes. In 1583, the famous mathematician Ostilio Ricci chanced to be in Pisa, on his way from Rome to Milan, and gave a lecture at the Court, on Geometry. Galileo was not interested in the theme, but he was in the speaker, and so he attended the lecture.

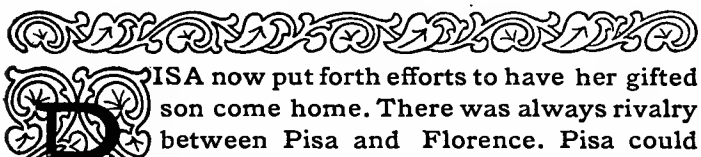
This action proved to be a pivotal point in his life. ¶ "Whether other people really teach us anything, is a question," says Stanley Hall, "but they do sometimes give us impulses, and make us find out for ourselves." ¶ Ricci made Galileo find out for himself. From Plato, he turned to Archimedes. Geometry became a passion, and a wise man has told us that we never accomplish anything, either good or bad, without passion. Passion means one hundred pounds of steam on the boiler, with love sitting on the safety-valve, when the blow-off is set for fifty. It surely is risky business, I will admit; accidents occasionally occur and explosions sometimes happen, but everything is risky, even life, since few get out of it alive. And so, to drop back to the original proposition, nothing great and sublime is ever done without passion.

Galileo had had his mechanical whooping-cough, musical mumps, artistic measles, and now the hectic flush of mathematics burned on his cheeks. He talked and dreamed mathematics. Euclid was in the saddle. ¶ Ricci became interested in the talented young scholar, and remained longer at Pisa than he had intended, that they might sit up all night and surprise the rising sun, discussing the beauties of dimensions and the wonders of dynamics.

Together they went to Florence, where Ricci introduced his pupil as a pedagogic sample of the goods, just as Booker Washington usually takes with him on his travels a few ebony homo bricks as specimens from Tuskegee

The beauty and grace of Galileo's speech and presence quite put the abstract Ricci in the shadow. The right man can make anything interesting, just as Dean Swift could write an entrancing essay with the broomstick as a central theme. The man's the thing, Hamlet to the contrary, notwithstanding.

Galileo knew the Florentine heart and so he gave lectures on a Florentine—one Dante, who loved a girl named Beatrice. The young Pisan drew diagrams of Dante's Inferno—and surely it was nobody else's. He gave its size, height, weight, and told how to reach it. He gave lectures on the Hydrostatic Balance and the Centers of Gravity, and published them as serials. The Florentines crowned him with bay and proclaimed him "The Modern Archimedes."



PISA now put forth efforts to have her gifted son come home. There was always rivalry between Pisa and Florence. Pisa could not afford to supply Florence her men of genius, let her depend upon home production, or go without.

Galileo became Professor of Mathematics in the University of Pisa, a life position, or at least one he could hold during good behavior.

One of the time-honored dictums of the day was that falling bodies fell with a velocity proportioned to their weight. The question was first thrashed out in the class-room; and after Galileo had somewhat slyly got-

ten all of these scientific wiseacres to commit themselves, he invited them, with all their students, to the Leaning Tower. Then he proved by ocular demonstrations that they were positively wrong.

It is very beautiful to teach Truth, but error should not be corrected with too much eclat. If the love of Truth, alone, was the guiding impulse of Galileo, he might have secretly explained his theory to one of the wiseacres, and this wiseacre could have casually demonstrated it, so all the rest could have said, "That is what we always knew and taught."

Instead of this, Galileo compelled the entire faculty to back water and dine on fricasseed crow. They got even by calling him "a scientifico bastardino," and at his next lecture, he was roundly hissed. Soon after he was bluntly informed that his office was to teach the young, and not undo the old.

And that is the way the troubles of Galileo began.

He might then have apologized, and slipped back into peace and obscurity, and later been tucked in by kind oblivion. But he had tasted blood, and the rabies of setting the scientific world straight, for its own good, was upon him.

That he was wrong in correcting his elders, he would not for a moment admit; and he was even guilty of saying, "Antiquity cannot sanctify that which is wrong in reason and false in principle."

Soon after he committed another forepaugh by showing that a wonderful boat invented by Giovanni de Medici for fighting hostile ships, would not work, since there

were no men on board to guide it, and its automatic steering apparatus would quite as likely run its nose into land, as into the hull of the enemy. He also decorated his argument with a few subtle touches as to the beauty of fighting battles without going to war and risking life and limb.

Men who are not kind to the faults of royalty can hope for small favor in a monarchy, even though the monarchy be a republic.

Galileo was cut off the Standard Oil payroll, and forced to apply to a teachers' agency, that he might find employment. He did not wait long; the rival University of Padua tendered him a position on a silver platter; and the Paduans made much dole about how unfortunate it was that men could not teach Truth in Italy, save at Padua—alas!

The Governing Board of Padua made a great stroke in securing Galileo, and Pisa fell back on her Leaning Tower as her chief attraction.

From a position of mediocrity, the University of Padua gradually rose to one of world-wide celebrity. Galileo remained at Padua from 1592 to 1610, which years are famous not alone through the wonderful inventions of Galileo, but because in that same interval of time, at least thirty of Shakespeare's thirty-seven plays were written. Surely, God was smiling on the planet Earth!

¶ Galileo's salary was raised yearly, starting at two hundred florins, until it reached over one thousand florins, not to mention the numerous gifts from grateful pupils, old and young. Students came to Padua

from all over the world to hear Galileo's lectures. Starting with a common class-room, the audience increased so that a special auditorium was required that would seat two thousand persons. It was during this time that Galileo invented the proportional compasses, an instrument now everywhere in use, without the slightest change having been made in it.

He also invented the thermometer; but greatest, best and most wonderful of all, he produced an instrument through which he could view the stars, and see them much magnified. With this instrument, he saw heavenly bodies that had never been seen before; he beheld that Jupiter had satellites which moved in orbits, and that Venus revolved, showing different sides at different times, thus proving that which Copernicus declared was true, but which, for lack of apparatus, he could not prove.

Galileo Galilei was getting to be something more than a professor of mathematics—he was becoming a world-power. The lever of his mind was finding a fulcrum.

THE year 1609 is forever fixed in history, through the fact that in that year Galileo invented the telescope.

Every good thing is an evolution. "Specillum," or helps to read, had been made, and sold privately and mysteriously, as early as the year 1400. These first magnifying glasses were associated with magic, or wonder-working; the

words magnify and magic having a common source and a similar meaning. Magicians wore big square glasses, and by their aid, some of them claimed to see things at great distance; and also to perceive things stolen, hidden, or lost. Occasionally, the magician would persuade his customer to try on the glasses, and then even common men could see for themselves that there was something in the scheme—goodness me! The use of spectacles were at first confined entirely to these wonder-workers—or men who magnified things forever. During the Fifteenth Century, public readers and the priests occasionally wore spectacles. To read was a miracle to most people, and a book was a mysterious and sacred thing—or else a diabolical thing. The populace would watch the man put on his "specillum," and the idea was everywhere abroad that the magic glasses gave an ability to read; and that anybody who was inspired by angels, or devils, who could get hold of spectacles, could at once read from a book.

¶ We hear of one magician, who, about the year 1500, made a box with a glass cover that magnified the contents. This great man would catch a flea and show it to the people. Then he would place the flea in the box and show it to them, and they would see that it had grown enormously in an instant. The man could make it big or little, by just taking off and putting on the cover of the box! This individual worked wonders for a consideration, but fate overtook him and he was smothered under a feather-bed for having too much wizard in his cosmos. A wizard, be it known, is a male

witch, and the Bible says, "Thou shalt not suffer a witch to live," although it does not say anything about wizards. ¶ But please note this: the wizard who had that magic box and flea, had really the first microscope. ¶ About the year 1607, Galileo bought a pair of "magic glasses," or spectacles; and his action, in so doing, was freely criticized.

On a visit to Venice, where glass had been manufactured since long before the Flood, Galileo was looking through one of the glass factories, just as visitors do now, and one of the workmen showed him a peculiar piece of glass which magnified the hairs on the back of his hand many times.

In a very few days after this, Galileo heard that a Dutch spectacle-maker had placed certain queer shaped pieces of glass in a tube, and offered to sell this tube to the Government, so by its use, soldiers could perceive the movements of an enemy many miles away. ¶ That night Galileo did not close his eyes in sleep. He thought out a plan by which he could place pieces of glass in a tube, and bring the stars close to earth. ¶ By daylight the whole plan was clear in his mind, and he hastened to the shop of the glass-makers. Two lenses were made, one plano-convex, and the other plano-concave, and these were placed in a tube made of sheet copper. It was tested on distant objects; and behold! they were magnified by three. Would this tube show the stars magnified? Galileo knew of no reason why it should not, but he paced his room in hot impatience, waiting for the night to come with its twink-

ling wonders, that he might verify his convictions. When the first yellow star appeared in the west, Galileo turned his tube upon it, and behold! instead of twinkling points of light, he saw a round mass—a world—moving through space, and not a scintillating object with five points. The twinkling spikes, or points, were merely an optical illusion of the unaided senses.

Galileo made no secret of his invention. It was called "Galileo's Tube," but some of the priests called it Galileo's "Magic Tube."

Yet it marked an era in the scientific world. Galileo endeavored constantly to improve his instrument; and from a threefold magnifying power, he finally made one that magnified thirty-two times.

Galileo made hundreds of telescopes, and sold them at moderate prices to any one who would buy. He explained minutely the construction of the instrument, showing how it was made in accordance with the natural laws of optics. His desire was to dissipate the superstition that there was something diabolical, or supernatural about the "Magic Tube"—that in fact, it was not magic, and the operator had no peculiar powers; you had simply to comply with the laws of nature, and any one could see for himself.

It is hard for us, at this day, to understand the opposition that sprang up against the telescope. We must remember that at this time the belief in witchcraft, fairies, sprites, ghosts, hobgoblins, magic and supernatural powers was common. Men who believe in miracles make poor scientists. There were books about

"Magic," written by so-called scientific men, whose standing in the world was quite as high as that of Galileo.

In 1610 Galileo published his book entitled, "Sidera Medicea," wherein he described the wonders that could be seen in the heavens by the aid of the telescope. Among other things he told how the Milky Way was not a great streak of light, but was comprised of a multitude of stars; and he made a map of stars that could not be seen, excepting by the aid of the telescope.

At this time there resided in Venice a scientific man, much more popular than Galileo, by the name of Porta. He was a priest, whose piety and learning was unimpeached. The year after Galileo issued his book, Porta put out a work much more pretentious, called "Natural Magic." In this book Porta does not claim that magicians all have supernatural powers; but he goes on to prove how they deceive the world by the use of their peculiar apparatus, and intimates that they sometimes sell their souls to the devil, and then are positively dangerous. He dives deep into science, history, and his own imagination to prove things. The man was no fool—he constructed a kaleidoscope that showed an absolute, geometrical symmetry, where in fact there was only confusion. He showed how, by the use of mirrors, things could be made big, small, tall, short, wide, crooked, or distorted. He told of how magicians, by the use of Galileo's tube, could show seven stars where there was only one; and he even made such a tube of his own and called the priests to-

gether to look through it. He painted stars on the glass, and had men look at the heavens. He even stuck a louse on the lens and located the beast in the heavens, for the benefit of a doubting Cardinal. It was all a joke, but at the time, no sober si ncereman of Science could argue him down. He owned "bum" telescopes that proved all kinds of things, to the great amusement of the enemies of Galileo. The intent of Porta was to expose the frauds and fallacies of Galileo. Porta also claimed that he had seen telescopes by which you could look over a hill and around a corner, but he did not recommend them, since by their use things were often perceived that were not there.

And so we see why the priests positively refused to look through Galileo's tube, or to believe anything he said. Porta, and a few others like him, showed a deal more than Galileo could and offered to locate stars anywhere on order.

Galileo had much offended these priests by his statements that the Bible did not contain the final facts of Science, and now they were getting even with a vengeance. It was all very much like the theological guffaw that swept over Christendom when Darwin issued his "Origin of Species," and Talmage and Spurgeon set their congregations in a roar by gentle references to monkey ancestry.

AMID the general popping of theological small-arms, Galileo moved steadily forward. If he had many enemies he surely had a few friends. As he once had proved more than Pisa could digest, so now he was bringing to the surface of things more truth than Padua could assimilate. Venice too was getting uncomfortable. Even the Doge once said, in reply to an enthusiastic admirer of Galileo, "Your master is not famous—he is merely notorious."

It was discovered that Galileo had been living with a woman by the name of Marina Gamba, at Venice, even while he held the professorship at Padua; and that they had a son, Vincenzo Gamba, & two daughters. One of the enemy drew a map of the heavens, showing Galileo as the sun, Marina Gamba as the moon, and around them circulated numerous little satellites, which were supposed to be their children. The picture had so great a vogue that the Doge issued an order that all copies of it be destroyed.

Of Marina Gamba we know very little; but the fact that she made entries in Galileo's journal and kept his accounts, proves that she was a person of considerable intelligence; and this was at a time when semi-oriental ideas prevailed and education was supposedly beyond the feminine grasp.

Galileo did not marry for the reason that he was practically a priest—a teacher in a religious school, living with and looking after the pupils—and the custom was that one engaged in such an occupation should not wed.

THE stormy opposition to Galileo was not without its advantages. We are advertised no less by our rabid enemies than by our loving friends. Cosimo II., Grand-Duke of Tuscany, had intimated that Florence would welcome the great astronomer. Galileo moved to Florence under the protection of Cosimo, intending to devote all of his time to Science.

¶ In quitting school-teaching and popular lecturing, he really made a virtue of necessity. No orthodox lyceum course would tolerate him; he was neither an impersonator nor an entertainer; the stereopticon, and the melodramatic were out of his line and his passion for truth made him impossible to the many.

He was treading the path of Bruno: the accusations, the taunts and jeers, the denials and denunciations, were urging him on to an unseemly earnestness.

Father Clavius said that Galileo never saw the satellites of Jupiter until he made an instrument that would create them; and if God had intended that men should see strange things in the heavens, He would have supplied them sufficient eyesight. The telescope was really a devil's instrument.

Still another man declared that if the earth moved, acorns falling from a high tree would all fall behind the tree and not directly under it.

Father Brini said that if the earth revolved, we would all fall off of it into the air when it was upside down; moreover, its whirling through space would create a wind that would sweep it bald.

Father Caccini preached a sermon from the text, "Ye men of Galilee, why stand ye gazing up into heaven?" Only he changed the word "Galilee" to "Galileo," claiming that it was the same thing, only different; and as reward for his wit he was made a bishop.

Cardinal Bellarmine, a man of great energy: earnest, zealous, sincere and learned—the Dr. Buckley of his day—showed how that, "If the Copernican Theory should prevail, it would be the absolute undoing of the Bible, and the destruction of the Church, rendering the death of Christ futile. If the earth is only one of many planets, and not the center of the universe, and the other planets are inhabited, the whole plan of salvation fails, since the inhabitants of the other spheres are without the Bible, and Christ did not die for them." This was the argument of Father Lecazre, and many others who took their cue from him.

Galileo was denounced as "atheist" and "infidel"—epithets that do not frighten us much now, since they have been applied to most of the really great and good men who have ever lived. But then such words set fire to masses of inflammable prejudices, and there were conflagrations of wrath and hate against which it were vain to argue.

The Archbishop of Pisa especially felt it incumbent upon him "to bring Galileo to justice." Galileo was born at Pisa, educated there, taught in the University; and now he had disgraced the place and brought it into disrepute ❧ ❧

Galileo was still in communication with teachers at

Pisa, and the Archbishop made it his business to have letters written to Galileo asking certain specific questions. One man, Castelli, declined to be used for the purpose of entrapping Galileo, but others there were who loaned themselves to the plan.

In 1616, Galileo received a formal summons from Pope Paul V. to come to Rome and purge himself of heresies that he had expressed in letters which were then in the hands of the Inquisition.

Galileo appealed to his friends at Florence, but they were powerless. When the Pope issued an order, it could not be waived.

The greatest thinker of his time journeyed to Rome and faced the greatest theologian of his day, Cardinal Bellarmine. The Cardinal firmly and clearly showed Galileo the error of his way.

Galileo offered to prove for the Cardinal by astronomical observations that the Copernican Theory was true.

¶ Cardinal Bellarmine said that there was only one truth and that was spiritual truth. That the Bible was true, or it was not. If not, then was religion a fallacy and our hope of heaven a delusion.

Galileo contended that the death of Christ had nothing to do with the truth, so Science and these things should not be shuffled and confused.

This attitude of mind greatly shocked the Inquisitors, and they made haste to inform the Pope, who at once issued an order that the astronomer should be placed in a dungeon until he saw fit to disavow that the sun was the center of the universe, and the earth moves.

¶ A sort of compromise, it seems, was here effected by Galileo's promise not to further teach that the earth revolves ❧ ❧

He was kept at Rome under surveillance for some months, but was finally allowed to return to Florence, and cautioned that he must cease all public teaching, speaking and writing on the subject of astronomy.

On March 5, 1616, the consulting theologians of the Holy Office, reiterated that the two propositions of Galileo, that the sun is the center of the universe, and that the earth has a rotary motion, were "absurd in philosophy, heretical and contrary to Scripture."

¶ The works of Copernicus were then placed upon the Index, and Pope Paul issued a special decree, warning all Churchmen to "abjure, shun and forever abstain from giving encouragement, support, succor or friendship to any one who believed or taught that the earth revolves."

The name of Copernicus was not removed from the Index until the year 1818.

GALILEO made his way back to Florence, a defeated and disappointed man. He had not been tortured excepting mentally, but he had heard the dungeon key turned in the lock and felt the humiliation of being a captive. The instruments of torture had been shown him and he had heard the cries of the condemned ❧ ❧

The cell that Bruno had occupied was his and he was also taken to the spot where Bruno was burned—the place was there, but where was Bruno!

He realized how utterly impossible it was to teach truth to those who did not desire truth, and the vanity of replying to men for whom a pun answered the purposes of fact.

As he could neither teach nor lecture at Florence, his services to the court were valueless. He was a disgraced and silenced man.

He retired to a village a few miles from the city, and in secret continued his studies and observations.

The Grand-Duke supplied him a small pension and suggested that it would be increased if Galileo would give lectures on Poetry and Rhetoric, which were not forbidden themes, and try to make himself either commonplace or amusing.

We can imagine the reply—Galileo had but one theme, the wonders of the heavens.

SO the years went by, and Galileo was sixty-seven years old, impoverished & forgotten, yet in his proud heart burned the embers of ambition. He believed in himself; he believed in the sacredness of his mission. Pope Paul had gone on his long journey, for even infallible popes die. Cardinal Barberini had become Pope Urban VIII. Years before Galileo and Barberini had taught together at Padua, and when

Galileo was silenced, a long letter of sympathy had come from his old colleague and occasionally since they had exchanged friendly letters.

Galileo thought that Urban was his friend and he knew that Urban, in his heart, believed in the Copernican Theory ❧ ❧

Galileo emerged from his seclusion and began teaching and speaking in Florence. He also fitted up an observatory and invited scholars to make use of his telescope ❧ ❧

Father Melchior here put forth a general denunciation, aimed especially at Galileo, without mentioning his name, to this effect: "The opinion of the earth's motion is, of all heresies, the most abominable, the most pernicious, the most scandalous: the immovability of the earth is thrice sacred. An argument against the existence of God and the immortality of the soul would be sooner tolerated than the idea that the earth moves."

¶ In reply to this fusillade, in 1632, Galileo put forth his book entitled, "The Dialogue," which was intended to place the ideas of Copernicus in popular form.

Galileo had endeavored to communicate with Urban, but the Pope had chosen to ignore him—to consider him as one dead. Galileo misconstrued the silence, thinking it meant that he could do and say what he wished and that there would be no interference.

A copy of Galileo's book reaching the Pope, his silence was broken. The book was condemned and all copies found were ordered to be burned by the hangman in the public streets. But the book had met with a wide

sale and many copies had been carried to Germany, England and France, and in these countries the work was reprinted and sent back to Italy.

Urban ordered Galileo to present himself at Rome forthwith. A score of years had passed since Galileo's former visit—he had not forgotten it.

He wrote to the Pope apologizing for having broken the silence imposed upon him by Pope Paul; he offered to again go into retirement; stated that he was old, infirm, without funds, and excused himself from obeying the order to go to Rome.

It was in vain that a preventory order was now issued and sent to the Papal Nuncio at Florence. This was equivalent to an arrest. Galileo must go to Rome and answer for having broken the promises he had made to the Inquisition. If he would not go willingly, he should go in chains.

Arriving at Rome, he had several audiences with the Pope who argued that nothing but an implicit recantation would now answer.

What Barberini had believed was one thing, what the Pope must do was another. Galileo should recant in order to keep the people from thinking that Pope Urban would allow what his predecessors would not. The matter had become a public scandal.

Galileo tried to argue the question and asked for time to consider it. An order was issued that he should be imprisoned. It was done.

Galileo asked for pens and paper that he might prepare his defense. These were refused and an order of tor-

ture was issued. It was not a trial, defense was useless. Again he was asked to recant—the matter was all written out—he had but to sign his name. He refused. He was brought to the torture chamber.

Here legend and fact separate. There are denials from Churchmen that Galileo was so much as imprisoned. One writer even has tried to show that Galileo was a guest of the Pope and dined daily at his table. The other side has told us that Galileo was thrust into a dungeon, his eyes put out and his broken-down old form tortured on the wheel.

Recent careful researches reveal that neither side told the truth. We have official record of the case written out at the time for the Vatican archives. Galileo was imprisoned and the order of torture issued, but it was never enforced. Perhaps it was not the intention to enforce it—it may have been only a "war measure." Galileo was alternately taken from dungeon to palace that he might realize which course was best for him to pursue: oppose the Church or uphold it. Thus we see that there was some truth in the statement that "he dined daily with the Pope."

That the man was subjected to much indignity, all the world now knows. The official records are in the Vatican and the attempt to conceal them longer is out of the question. Wise Churchmen no longer deny the blunders of the past, but they say with Cardinal Satolli, "The enemies of the Church have been o'er-zealous Churchmen."

On his bended knees, Galileo, a man of three-score

and ten, broken in health, with spirit crushed, repeated after a priest these words: "I, Galileo Galilei, being in my seventieth year, a prisoner and now on my knees before your Eminences, the Cardinals of the Holy See, having before mine eyes the Holy Bible, which I touch with my hands and kiss with my lips, do abjure, curse and detest the error and heresy of the movement of the earth."

He also was made to sign the recantation. On arising from his knees, legend declares that he said, "Yet the earth does move!" It is hardly probable that the words reached his lips, although they may have been in his mind. But we must remember the man's heart was broken and he was in a mental condition where nothing really mattered.

To complete his dishonor all of his writings were placed on the Index, and he was made to swear that he would inform the Inquisition of any man whom he should hear or discover supporting the heresy of the motion of the earth.

The old man was then released, a prisoner on parole, and allowed to make his way home to Florence, which he did by easy stages, helped along the way by friendly monks who discussed with him all questions but those of astronomy.

Galileo's eldest daughter, a nun, whose home was near his, was so affected by the humiliation of her father that she fell into a nervous decline and died very soon after he reached home. Between these two there had been a close bond of love and tender sym-

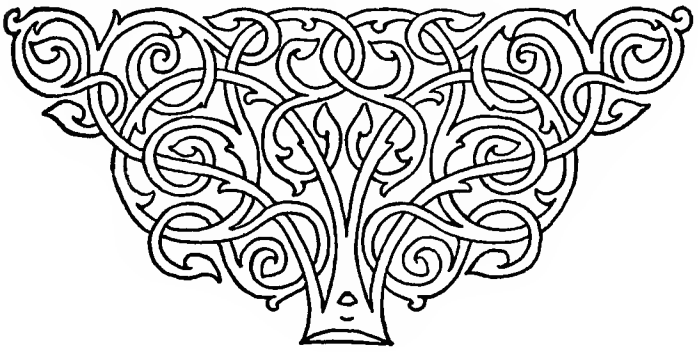
pathy and her death seemed almost the crowning calamity.

But once back to his village home at Arcetri, Galileo again went to work with his telescope, mapping the heavens. A goodly degree of health and animation came back to him, but his eyesight, so long misused, now failed him and he became blind. Thus Milton found him in 1638. Castelli, his lifelong friend, wrote to another, "The noblest eye that God ever made is darkened: the eye so privileged that it may in truth be said to have seen more wonderful things and made others to see more wonderful things, than were ever seen before." But blindness could not subdue him any more than it could John Milton. He had others look through the telescope and tell him what they saw and then he would foretell what they would see next.

The policy of the Pope was that Galileo should not be disturbed so long as he kept to his village home and taught merely the few scholars or "servants," as they called themselves, who came to him, but these were to be taught mathematics and not astronomy. That he was even at the last under suspicion is shown that concealed in the mattress of the bed upon which he died were records of his latest discoveries concerning the revolution of the planets. Legal opposition was made as to his right to make a will, the claim being that he was a prisoner of the Inquisition at his death. For the same reason his body was not allowed to be buried in consecrated ground. The Pope overruled the objection and he was buried in an obscure corner of

the little cemetery of St. Croce, the grave unmarked. ¶ So the last few years of Galileo's life were years of comparative peace and quiet. He needed but little and this little his few faithful, loving friends supplied. His death came painlessly and his last moments were sustained by the faith that he would soon be free from the trammels of the flesh and visit some of the worlds his telescope had brought so near.

Galileo was born the day that Michæl Angelo died; the year of his death was the year that Sir Isaac Newton, discoverer of the law of gravity, was born.



HERE ENDETH THE LITTLE JOURNEY TO THE HOME OF GALILEO, AS WRITTEN BY ELBERT HUBBARD. THE BORDERS, INITIALS AND ORNAMENTS DESIGNED BY ROYCROFT ARTISTS, THE PRESSWORK BY LOUIS SCHELL, & THE WHOLE DONE INTO A BOOK BY THE ROYCROFTERS AT THEIR SHOP WHICH IS IN EAST AURORA, NEW YORK, IN FEBRUARY OF THE YEAR MCMV

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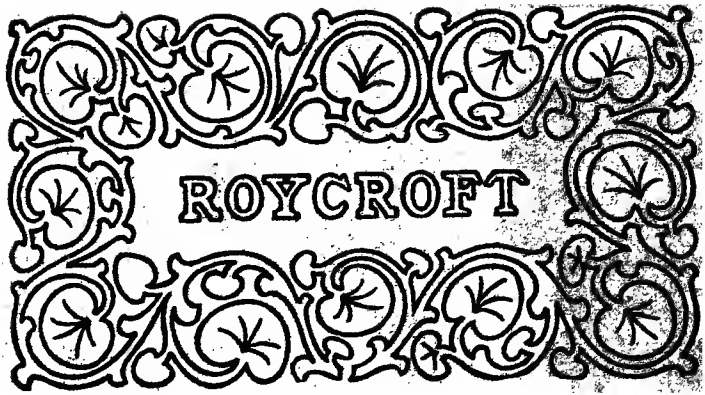
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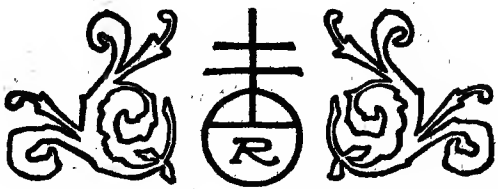
Vol. XVI MARCH, 1905 No. 3

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To Homes of Great Scientists

By ELBERT HUBBARD

NEWTON



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FAILING EYESIGHT

Caused by Improper Food.

Writers who live sedentary lives and who use coffee are apt to be troubled by faulty vision, which they usually attribute to overwork. That they are sometimes mistaken is proved by the following statement from an old newspaper man:

"For nearly 40 years I have earned my living with the pen. A few years ago I began to suffer from occasional 'blind spells.' My vision frequently became obscured by what may be called kaleidoscopic blurs, in which constantly changing figures like wheels, stars, etc., floated before my eyes, making it impossible for me to work while they lasted. They were usually followed by dull, heavy headaches.

"My physicans, two of them, advised me that my eyes had become weakened by overwork. I consulted an oculist, but he could not discover the cause of the trouble. I bought stronger glasses but they did not help me.

"Last summer, while living temporarily in a boarding house, I found the very weak coffee a thing to complain of, till suddenly I discovered that my 'blind spells' were becoming less frequent. I then satisfied myself by experiments that it was coffee that was deranging my optic nerves.

"A friend advised me to try Postum coffee, and although I had no faith in it, I began to use it. In three days' time the 'blind spells' completely ceased. Going back to the old coffee the 'blind spells' returned. I am entirely satisfied that coffee was the cause of the ailment, and that Postum was its cure." Name given by Postum Co., Battle Creek, Mich.

There's a reason. Coffee is a narcotic that breaks down the cells in the nerve centres and unless nature succeeds in repairing the damage each day, disease and distress follows in some one or more organs. It may be eyes in one, stomach and bowels in another, heart or kidneys in another and yet each effected from the same cause, coffee. The sure way to certainly know is to quit coffee 10 days and use Postum. If the disease begins to disappear you have the key to your puzzle.



Sir Isaac Newton

LITTLE JOURNEYS TO HOMES OF GREAT SCIENTISTS

Newton



WRITTEN BY ELBERT HUBBARD AND DONE INTO BOOK FORM BY THE ROYCROFTERS AT THEIR SHOP, WHICH IS IN EAST AURORA, NEW YORK, A.D. MCMV

SIR ISAAC NEWTON

WHEN you come into any fresh company, observe their humours. Suit your own carriage thereto, by which insinuation you will make their converse more free and open. Let your discours be more in querys and doubtings than peremptory assertions or disputings, it being the designe of travelers to learne, not to teach. Besides, it will persuade your acquaintance that you have the greater esteem of them, and soe make them more ready to communicate what they know to you; whereas nothing sooner occasions disrespect and quarrels than peremptorinesse. You will find little or no advantage in seeming wiser, or much more ignorant than your company. Seldom discommend any thing though never so bad, or doe it but moderately, lest you bee unexpectedly forced to an unhansom retraction. It is safer to commend any thing more than is due, than to discommend a thing soe much as it deserves; for commendations meet not soe often with oppositions, or, at least, are not usually soe ill resented by men that think otherwise, as discommendations; and you will insinuate into men's favour by nothing sooner than seeming to approve and commend what they like; but beware of doing it by a comparison.

SIR ISAAC NEWTON to one of his pupils.

SIR ISAAC NEWTON

AN honest farmer, neither rich nor poor, was Isaac Newton. He was married to Harriet Ayscough in February, 1642. Both were strong, intelligent and full of hope. Neither had any education to speak of—they belonged to England's middle class—that oft despised and much ridiculed middle class which is the hope of the world. Accounts still in existence show that their income was thirty pounds a year. It was for them to toil all the week, go to church on Sunday, and twice or thrice in a year attend the village fairs or indulge in a holiday where hard cider played an important part.

Isaac had served his two years in the army, taken a turn at the sea, and got his discharge papers. Now he had married the lass of his choice, and settled down in the little house on an estate in Lincolnshire where his father was born and died.

¶ Spring came, and the roses clambered over the stone walls; bobolinks played hide and seek in the waving grass of the meadows; the skylarks sang and poised and soared; the hedge-rows grew white with hawthorne blossoms and musical with the chirp of sparrows; the cattle

ranged through the fragrant clover "knee deep in June."

¶ Oftentimes the young wife worked with her husband in the fields, or went with him to market. Great plans were laid as to what they would do next year, and the year after, and how they would provide for coming age and grow old together, here among the oaks and the peace and plenty of Lincolnshire.

In such a country, with such a climate, it seems as if one could almost make repair equal waste, and thus keep death indefinitely at bay. But all men, even the strongest, are living under a death sentence with but an indefinite reprieve. And even yet, with all of our science and health we cannot fully account for those diseases which seemingly pick the very best flower of sinew and strength.

Isaac Newton, the strong and rugged farmer sickened and died in a week. "The result of a cold caught when sweaty and standing in a draft," the surgeon explained. "The act of God to warn us all of the vanity of life." Acute pneumonia, perhaps is what we would call it—a fever that burned out the bellows in a week. In such cases the very strength of the man seems to supply fuel for the flames.

And so just as the autumn came with changing leaves, the young wife was left to fight the battle of life alone; alone save for the old, old miracle that her life supported another.

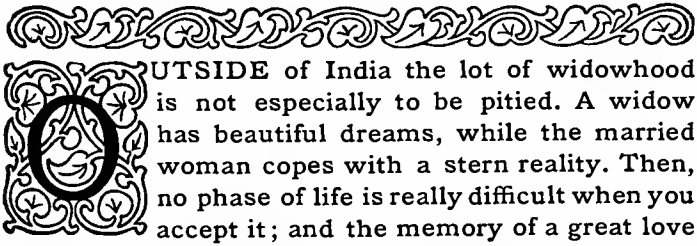
A wife, a widow, a mother—all within a year!

On Christmas day the babe was born—born where most men die: in obscurity. He was so weak and frail

that none but the mother believed he would live. The doctor quoted a line from Richard III., "Sent before my time into this breathing world scarce half made up," and gave the infant into the keeping of an old nurse with an ominous shake of the head, and went his way, absolved. His time was too valuable to waste on such a useless human mite.

The persistent words of the mother that the child should not—must not die—possibly had something to do with keeping the breath of life in the puny man-child. The fond mother had given him the name of his father, even before birth! He was to live to do the work that the man now dead had hoped to do, that is, live a long and honest life, and leave the fair acres more valuable than he found them.

And such was the inauspicious beginning of what Herbert Spencer declared was the greatest life since, three hundred years before Christ, Aristotle studied the stars and made wise guesses into the secrets of nature.



OUTSIDE of India the lot of widowhood is not especially to be pitied. A widow has beautiful dreams, while the married woman copes with a stern reality. Then, no phase of life is really difficult when you accept it; and the memory of a great love lost is always a blessing and a benediction to the one who endures the first cruel shock.

The young widow looked after her little estate, and with perhaps some small assistance from her parents, lived comfortably and as happily as one has right to in this vale of tears. Her baby boy had grown strong and well: by the time he was two years old he was quite the equal of most babies, and his mother thought, beyond them.

It is often stoutly declared by callow folks that mother-love is the strongest and most enduring love in the world, but the wise waste no words on such an idle proposition. Mother-love retires into the shadow when the other kind appears.

When the Rev. Barnabas Smith began, unconsciously, to make eyes at the Widow Newton over his prayer-book, the good old dames whose business it is to look after these things, and perform them vicariously, made prophecies on the way home from church as to how soon the wedding would occur. People go to church to watch and pray, but a man I know says that women go to church to watch. Young clergymen fall an easy prey to designing widows, he avers. I can discover no proof, however, that the Widow Newton made any original designs—she was below the clergyman in social standing, and when the good man began to pay special attentions to her baby boy she never imagined that the sundry pats and caresses were meant for her.

¶ Little Isaac Newton was just three years old when the wedding occurred, and was not troubled about it. The bride went to live with her husband at the rectory, a mile away, and the little boy in dresses, with long

yellow curls, was taken to the home of his grandmother. The Rev. Barnabas Smith didn't like babies as well as he at first thought.

Grandparents are inclined to be lax in their discipline. And anyway it is no particular difference if they are—a scarcity of discipline is better than too much. More boys have been ruined by the rod than saved by it—love is a good substitute for a cat-o'-nine-tails.

There were several children born to the Rev. Barnabas Smith and his wife and all were disciplined for their own good. Isaac, a few miles away, snuggled in the arms of his ol' grandmother when he was bad and went scot free.

Many years after, Sir Isaac Newton in an address on education at Cambridge playfully referred to the fact that in his boyhood he did not have to prevaricate to escape punishment, his grandmother being always willing to lie for him. His grandmother was his first teacher and his best friend as long as she lived.

When he was twelve years old he was sent to the village school at Grantham, eight miles away. There he boarded with a family by the name of Clark, and at odd times helped in the apothecary shop of Mr. Clark, cleaning bottles and making pills. He himself has told us that the working with mortar and pestle, cutting the pills in exact cubes, and then rolling one in each hand between thumb and finger, did him a lot of good whether the patients were benefited or not. The genial apothecary also explained that pills were for those who made and sold them, and that if they did no harm to

those who swallowed them, the whole transaction was then one of benefit. All of which proves to us that men had the essence of wisdom two hundred years ago quite as much as now.

The master of the school at Grantham was one Mr. Stokes, a man of genuine insight and tact—two things rather rare in the pedagogic equipment at that time. The Newton boy was small and stood low in his class, perhaps because book-learning had not been the bent of his grandmother. The fact that Isaac was neither strong nor smart nor even smartly dressed, caused him to serve in the capacity of a butt for the bullies.

One big boy in particular made it his business to punch, kick and cuff him on all occasions in class or out. This continued for a month, when one day the little boy invited the big one out into the church-yard and there fell upon him tooth and claw. The big boy had strength, but the little one had right on his side.

The schoolmaster looked over the wall and shouted, "Thrice armed is he who knows his cause is just!" In two minutes the bully was beaten, but the schoolmaster's son who stood by as master of ceremonies, suggested that the big boy have his nose rubbed against the wall of the church for luck. This was accordingly done, not o'er gently, and when Isaac returned to the schoolroom, the master, who was supposed to know nothing officially of the fighting, prophesied, "Young Mr. Newton will yet beat any boy in this school in his studies."

It has been suggested that this prophecy was made

after its fulfillment, but even so, we know that Mr. Stokes lived long enough to take great pride in the Newton boy, and to grow reminiscent concerning his achievement.

Our hearts go out to the late Mr. Stokes, schoolmaster at Grantham.

THERE is surely something in that old idea of Indians that when they killed an enemy the strength of the fallen adversary entered into themselves.

This encounter of little Isaac with the school bully was a pivotal point in his career. He had vanquished the rogue physically and he now set to work to do as much mentally for the whole school. He had it in him—it was just a matter of application.

Once in after life in speaking of those who had benefited him most, he placed this unnamed chucklehead first, and added with a smile, "Our enemies are quite as necessary to us as our friends."

In a few months Isaac stood at the head of the class. In mathematics he especially excelled, and the Master, who prided himself on being able to give problems no one could solve but himself, found he was put to the strait of giving a problem nobody could solve. He was somewhat taken aback when little Isaac declined to work on it, and coolly pointed out the fallacy involved. The only thing then for the teacher to do was to say

he had purposely given the proposition to see if any one would detect the fallacy. This he gracefully did, and again made a prophecy to the effect that Isaac Newton would some day take his own place and be the master of Grantham School.

In the year 1656 the school-days of Isaac Newton were cut short by the death of his stepfather.

His mother, twice a widow, moved back to "Woolsthorpe," a big name for a very small estate. Isaac was made the man of the house. The ambition of his mother was that he should become a farmer and a stock-raiser.

¶ It seems that the boy entered upon his farm duties with an alacrity that was not to last. His heart was not in the work, but the desire to please his mother spurred him forward.

On one occasion, being sent to Grantham with a load of produce, he stopped in to visit his old school, and during his call struck a bargain with one of the boys for a copy of Descartes' Geometry. The purchase so exhausted his finances that he was unable to buy the articles his mother had sent him for, but when he got home he explained that one might get along without such luxuries as clothing but a good Geometry was a family necessity.

About this time he made a water clock, and also that sun-dial which can be seen today, carved into the stone on the corner of the house. He continued his making of kites which had been begun at Grantham; and gave the superstitious neighbors a thrill by flying kites at night with lighted lanterns made from paper, attached

to the tails. He made water-wheels and windmills, and once constructed a miniature mill that he ran by placing a mouse on a treadmill inside.

In the meantime the cows got into the corn, and the weeds in the garden improved each shining hour. The fond mother was sorely disappointed in her boy, and made remarks to the effect that if she had looked after his bringing up instead of entrusting him to an indulgent grandmother, affairs would not be in their present state. Parents are apt to be fussy—they cannot wait.

¶ Matters reached a climax when the sheep, that Isaac had been set to watch, overran the garden and demolished everything but the purslane & ragweed, while all the time the young man was under the hedge working out mathematical problems from his Descartes.

¶ At this stage the good mother called in her brother, the Rev. Mr. Ayscough, and he advised that a boy who was so bound to study should be allowed to study. And the good rector offered to pay the wages of a man to take Isaac's place on the farm.

So, greatly to the surprise and pleasure of Mr. Stokes of Grantham, Isaac one fine day returned with his books, just as if he had only been gone a day instead of a year.

At the home of the apothecary the lad was thrice welcome. He had endeared himself to the women of the household especially. He did not play with other boys —their games and sports were absolutely outside of his orbit. He was silent and so self-contained that he won from his school-fellows the sobriquet of "Old

Cold-feet." Nothing surprised him; he never lost his temper; he laughed so seldom that the incident was noted and told to the neighbors; his attitude was one of abstraction, and when he spoke it was like a judge charging a jury with soda-water.

All of his spare time was given up to whittling, sawing, pounding and making mathematical calculations.

Not all of his inventions were toys, for among other things he constructed a horseless carriage which was run by a crank and pumping device, by the occupants. The idea of the horseless carriage is a matter that has long been in the minds of inventors. Several men, supremely great, have tried their hands and head at it. Leibnitz worked at it; Swedenborg prophesied the automobile, and made a carriage, placing the horse inside, and did not give up the scheme until the horse ran away with himself and demolished the result of a year's work. The government here interfered and placed an injunction against "the making of any more such diabolical contrivances for the disturbance of the public peace." All of which makes us believe that if Edison and Marconi had lived two hundred years ago, the bailiffs would have looked after them with the butt end of the law for the regulation of wizards & witches; wizards at Menlo Park being quite as bad as witches at Salem.

Isaac Newton's horseless carriage came to grief in a similar way to Swedenborg's invention—it worked so well and so fast that it turned a complete somersault into a ditch, and its manipulation was declared a pas-

time more dangerous than football. ¶ Not all the things produced by Isaac about this time were failures. For instance, among other things he made a table, a chair and a cupboard for a young woman who was a fellow-boarder at the apothecary's. The excellence of young Newton's work was shown in that the articles just mentioned outlasted both the owner and maker.

MUCH of the reminiscence concerning the Grantham days of Sir Isaac Newton comes to us from the fortunate owner of that historic table, chair and cupboard. This was Mary Story, afterward Mrs. Vincent. Miss Story was the same age as Isaac. She was eighteen when the furniture was made roycroftie—she was a young lady, grown, and wore a dress with a train; moreover, she had been to London and had been courted by a widower, while Isaac Newton was only a lad in round-abouts.

Age counts for little—it is experience and temperament that weigh in the scale. Isaac was only a little boy, and Mary Story treated him like one. And here seems a good place to quote Dr. Charcot who said, "In arranging the formula for a great man, make sure you delay adolescence—rare-ripes rot early."

Isaac and Mary became very good chums, and used to ramble the woods together hand in hand, in a way that must have frightened them both had they been on the same psychic plane. Isaac had about the same re-

gard for her that he might have had for a dear maiden aunt who would mend his socks and listen patiently, pretending to be interested when he talked of parallelograms and prismatic spectra. But evidently Mary Story thought of him with a thrill for she stoutly resented the boys calling him "Cold-feet."

In due time Isaac gravitated on to Cambridge.

Mary mooed a wee, but soon consoled herself with a sure-enough lover, and was married to Mr. Vincent, a worthy man and true, but one who had not sufficient soul-caloric to make her forget her Isaac.

This friendship with Mary Story is often spoken of as the one love affair in the life of Sir Isaac Newton. It was all prosily platonic on his part, but as Mary lived out her life at Grantham, and Sir Isaac Newton used to go there occasionally, and when he did, always called upon her, the relationship was certainly noteworthy ☙ ☙

The only break in that lifelong friendship occurred when each was past fifty. Sir Isaac was paying his little yearly call at Grantham; and was seated in a rustic arbor by the side of Mrs. Vincent, now grown gray, and the mother of a goodly brood, well grown up. As they thus sat talking of days agone, his thoughts ran off upon quadratic equations, and to aid his mind in following the thread, he absent-mindedly lighted his pipe, and smoked in silence. As the tobacco died low, he gazed about for a convenient utensil to use in pushing the ashes down in the bowl of his pipe. Looking down he saw the lady's hand resting upon his knee,

and straightway utilized the forefinger of his vis-a-vis. A suppressed feminine screech followed, but the fires of friendship were not quenched by so slight an incident, which Mrs. Vincent well knew grew out of temperament and not from wrong intent.

She lived to be eighty-five, and to the day of her death caressed the scar—the cicatrice of a love wound. All of which seems to prove that old women can be quite as absurd as young ones—goodness me!

WHEN Isaac was eighteen, Master Stokes was so impressed by his star scholar that he called in the Rev. Mr. Ayscough and insisted that the boy be sent to Cambridge. The uncle being a Cambridge man himself, thought this the proper thing to do.

¶ On June 5th, 1661, Isaac presented his credentials from his uncle and Mr. Stokes, and was duly entered to Trinity College as a subsizar, which means that he was admitted on suspicion. A part of the duties of a subsizar was to clean boots, scrub floors and perform various other delightful tasks which everybody else evaded.

To be at Trinity College in any capacity was paradise for this boy. He thirsted for knowledge—to know, to do, to perform—these things were his desire. He had been brought up to work, anyway, and to a country boy toil is no punishment. "I knew that if worse came to worst I could get employment in the town making fur-

niture and earn a man's wage," he said. ¶ In a month he had passed his first examinations and was made a sizar. Before this he had been fag to everybody, but now he was fag to the seniors only. He not only made their beds and cleaned their rooms, but worked their examples in mathematics, and thus commanded their respect ❧ ❧

Once in class, being called upon to recite from Euclid, he declined and shocked the professor by saying, "It is a trifling book—I have mastered it and thrown it aside." And it was no idle boast—he knew the book as the professor did not. When he arrived at Cambridge, he carried in his box a copy of Sanderson's Logic presented to him by his uncle—the uncle having no use for it. It happened to be one of the text-books in use at Trinity. When Isaac heard lectures on Sanderson he found he knew the book a deal better than the tutor, a thing the tutor shortly acknowledged before the class. ¶ This caused young Mr. Newton to stand out as a prodigy. Usually students have to rap for admittance to the higher classes, but now the teachers came and sought him out. One professor told him he was about to take up Kepler's Optics, with some post-graduate students—would young Mr. Newton come in? Isaac begged to be excused until he could examine the book. The volume was loaned to him. He tore the vitals out of it and digested them. When the lectures began he declined to go because he had mastered the subject as far as Kepler carried it.

Genius seems to consist in the ability to concentrate

your rays and focus them on one point. Isaac Newton could do it. "On a winter day I took a small glass and so centered the sun's rays that I burned a hole in my coat," he wrote in his subsizar journal.

The youth possessed an imperturbable coolness—he talked little, but when he spoke it was very frankly and honestly. From any other his words would have had a presumptuous and boastful sound. As it was he was respected and beloved. At Cambridge his face and features commended him—he looked like another Cambridge man, one Milton—John Milton—only his face was a little more stern in its expression than that of the author of "Paradise Lost."

In two years' time Isaac Newton was a scholar whom all Cambridge knew. He had prepared able essays on the squaring of curved and crooked lines, on errors in grinding lenses and the methods of rectifying them, and in the extraction of roots where the cubes were imperfect: he had done things never before attempted by his teachers. When they called upon him to recite, it was only for the purpose of explaining truths which they had not mastered.

In 1664, being in his twenty-second year, Isaac Newton was voted a free scholarship, which provided for board, books and tuition. On this occasion he was examined in Euclid by Dr. Barrow, the head Master of Trinity. ¶ Newton could solve every problem, but could not explain why or how. His methods were empirical—those of his own. Many men with a modicum of mathematical genius work in this way and in practical life

the plan may serve all right. ¶ But now it was shown to Newton that a school-man must not only know how to work great problems, but know why he goes at it in a certain way: otherwise colleges are vain—we must be able to pass our knowledge along. The really great man is one who knows the rules and then forgets them, just as the painter of supreme merit must be a realist before he evolves into an impressionist. ¶ Newton now acknowledged his mistake in reference to Euclid, and set to work to master the rules. This graciousness in accepting advice, and the willingness to admit his lapse, if he had been hasty, won for him not only the scholarship, but the love of his superiors. Milton was a radical who made enemies, but Newton was a radical who made friends. He avoided iconoclasm, left all matters of theology to the specialists, and accepted the Church as a necessary part of society. His care not to offend fixed his place in Cambridge for life. It was Cambridge that fostered and encouraged his first budding experiments; it was there he was sustained in his mightiest hazards; and it was within her walls that the ripe fruit of his genius was garnered and gathered. When his fame had become national and he was called to higher offices than Cambridge supplied, Cambridge watched his career with the loving interest of a mother, and the debt of love he fully paid, for it was through his name and fame that Cambridge first took her place as one of the great schools of the world.

NEWTON took his degree of Bachelor of Arts at Cambridge in January, 1665. The faculty of Trinity would not even consider his leaving the college: he was as valuable to them as he would be now if he were a famous football player. Beside the scholarship, there were ways provided so he could earn money by private tutoring and giving lectures in the absence of professors.

He had written his essay on fluxions, described their application to fluents and tangents, and devised a plan for finding the radius of curvity in crooked lines. In August of the same year that Newton was given his degree, the college was dismissed on account of an epidemic, and Newton went home to Woolsthorpe to kill time. In September, 1665, he then being twenty-three, while seated in his mother's garden, he saw that storied apple fall.

What pulled it down? Some force tugging at it, surely! ¶ Galileo had experimented with falling bodies, and had proved that the weight and size of a falling body had nothing to do with its velocity, save as its size and shape might be affected by the friction of the atmosphere. The first person to put in print the story of the falling apple was Voltaire, whose sketch of Newton is a little classic which the world could ill afford to lose. Adam, William Tell and Isaac Newton each had his little affair with an apple, but with different results. ¶ The falling apple suggested to Newton that there was some power in the ground that was constantly

pulling things toward the center of the earth. This power extended straight down into the earth—he knew it—he had dropped a stone into a mine, and had also dropped things from steeples. He dropped apples from kites by an ingenious device of two strings, and he concluded that an apple taken a hundred miles up in the air would return to earth. He then began to speculate as to what a body would do a thousand or ten thousand miles from the earth. So as high as we could go, or as deep as we could dig, this drawing power was always present.

The Law of Gravitation!

If a cannon-ball was fired in a straight line at a distant target, the gunner had to elevate the aim, if he would hit the target, for the ball described a curve and would keep dropping to the earth until it actually struck the ground. Something was pulling it down—what was it?

¶ The Law of Gravitation!

The moon was attracted toward us and would surely fall into us, but for the fact that there were other attractions drawing her toward them. The movements of the planets were owing to the fact that they were obeying attractions. They were moving in curves, just like cannon-balls in motion. They had two movements, also, like the cannon-ball.

Newton had noticed that the stars within a certain territory all moved in similar directions, and so must be acted upon by the same influences.

The Law of Gravitation! It is held by many people in East Aurora and elsewhere that Newton's invention

is a devilish device originated for the benefit of surgeons and crockery dealers. But this is not wholly true. ¶ Without this Law of Gravitation the Earth could not retain her spherical shape—only through this constant drawing in toward the center could she exist.

The other planets, too, must be round or they could not exist, and so they also had this same quality of gravity in common with the Earth—a drawing in of everything toward the center. Here was a positive discovery—this similarity of the heavenly bodies!

Every one of the heavenly bodies was exerting a constant attraction toward all other heavenly bodies, and this attractive power must be in proportion to the distance they were from the object acted upon. Thus were their movements and orbits accounted for.

At this time Newton was perfectly familiar with Kepler's Law, that the squares of the periodic times of a planet were as the cubes of its distance from the sun. And from this, he inferred that the attraction varied as the square of the planet's distance from the sun.

Here he was working on territory that had never been surveyed. At first, in his exuberance, he thought to quickly figure out the size and weight of each planet by measuring its attractive power. He did not realize that he had cut out for himself work that would require many men and several centuries to cover, but surely he was on the right scent—a finite man keen upon the secrets of the Infinite!

He was still at his mother's old home in the country, without scientific apparatus or the stimulus of col-

leagues, when we find by a record in his journal that antique groan because there were only twenty-four hours in a day, and that eight were required for sleep and eight more for recreation!

A subject a little nearer home than planetary attraction had now switched him off from measuring and weighing the stars. He was hard at work in his mother's little sitting-room, with the windows darkened, much to that good woman's perplexity.

By shutting out all light from the windows and allowing the sun's rays to enter by a single little circular aperture, he had gotten the sunlight captured and tamed where he could study it. This ray of light he examined by a small hand-glass that he himself had made. In looking at the ray, quite accidentally, he found it could be deflected and sent off at will in various directions. When thrown on the wall, instead of being simply white light it had seven distinct colors beginning with violet & running down to red. So white light was not a single element, it was made up of various rays which had to be united in order to give us sunlight. ¶ Eureka! He had found the secret of the rainbow—the sun's rays broken up and separated by the refracting agency of clouds!

Well does Darwin declare that the separation of sunlight into its component parts, and the invention of the spectrum, mark an advance in man's achievement such as the world had not seen since the time of Archimedes.



THE University at Cambridge was closed until October, 1667. Most of the intervening time Newton spent at the home of his mother, but from his accounts we see that the College people kept their eagle-eye upon him, for they sent him remittances regularly for "commons."

When he returned to Cambridge he was assigned to the "spiritual chamber," which was a room next to the chapel, that had formerly been reserved as a guest room for visiting dignitaries.

In March, 1668, he was given the degree of Master of Arts. His studies now were of a very varied kind. He was required to give one lecture a week on any subject of his own choosing. Needless to say his themes were mathematical or scientific. Just what they were can best be inferred by consulting his cash-book, since the lectures themselves were not written out and all memoranda concerning them has disappeared. This account-book shows expenditures for Gunter's Book (he who invented the Gunter's Chain) a magnet, compass, glue, bulbs, putty, antimony, vinegar, white lead, salts of tartar, and lenses.

In addition there are a few interesting items such as one sees in the Diary of George Washington—"Lost at cards, five shillings." "Treating at tavern, ten shillings." "Binding my Bible, three shillings." "Spent on my cousin, one pound, two." "Expenses for wetting my degree, sixteen shillings."

This last item shows that times have changed but little:

this scientist and philosopher par excellence had to moisten his diploma at the tavern for the benefit of good fellows who little guessed with whom they drank.

He also had "poor relation" come to visit him; and it is significant that while there are various items showing where he lost money at cards, there are no references to any money won at the same business, from which we infer that while there was no one at Cambridge who could follow him in his studies, there yet were those who could deal themselves better hands when it came to the pasteboards.

Evidently he got discouraged at playing cards, for after the year 1668, there are no more items of "treating at the tavern" or "lost at cards." The boys had tried to educate him, but had not succeeded. In card exploitation he fell a victim of arrested development.

I suppose it will not cause any one a shock to be told that "the greatest original thinker of all time" was not exactly a perfect man. So let the truth be known that throughout his life, Newton had a well-defined strain of superstition running through his character. He never quite relinquished the idea of transmutation of metals, and at times astrology was quite as interesting to him as astronomy.

In writing to a friend who was about to pay a visit to the mines of Hungary he says: "Examine most carefully and ascertain just how and under what conditions nature transforms iron into copper and copper into silver and gold."

In his laboratory he had specimens of iron ore that

contained copper, and also samples of copper ore that contained gold, and from this he argued that these metals were transmutable, and really in the act of transmutation when the process was interfered with by the miner's pick.

He had transformed a liquid into a mass of solid crystals instantly, and all of the changes possible in light, which he had discovered, had enlarged his faith to a point where he declared, "Nothing is impossible."

¶ It is somewhat curious that Newton, who had no soft sex-sentiment in his nature, quite unlike Galileo, still believed in alchemy and astrology, while Galileo's cold intellect at once perceived the fallacy of these things. Galileo also saw at once that for the sun to stand still at Joshua's command, would really mean that the Earth must cease her motion, since the object desired was to prolong the day. Sir Isaac Newton, who discovered the Law of Gravitation, yet believed that at the command of a barbaric chieftain, this Law was arrested, and all planetary attraction was made to cease while he fought the Philistines for the possession of pasture land to which he had no title.

Galileo did not know as much as Newton about planetary attraction, but very early in his career he perceived that the Bible was not a book that could be technically relied upon.

With Newton the Bible presented no difficulties. He regularly attended church and took part in the ritual. Religion was one thing and his daily work another. He kept his religion as completely separate from his life as

did Gladstone, who believed the Mosaic account of creation was literally true, and yet had a clear, cool, calculating head for facts.

The greatest financial exploiter in America today is an Orthodox Christian, taking an active part in missionary work and the spread of the Gospel. In his family he is gentle, kind and tender; a good neighbor a punctilious church-goer, a leader in Sunday-school, a considerate teacher of little children.

In business relations he is as conscienceless as Tamerlane, who built a mountain of skulls as a monument to himself. He is cold, calculating, and if opposed, vindictive. On occasion he is absolutely without heart: compassion, mercy or generosity are not then in his make-up. The best lawyers procurable are paid princely sums to study for him the penal code, and legislatures have even revised it for his benefit. Eviction, destruction, suicide and insanity have trod in his train. A picture of him makes you think of that dark and gloomy canvas where Alexander, Cæsar and Napoleon ride slowly side by side through a sea of stiffened corpses. Bribery, coercion, violence and even murder have been this man's weapons. He is the richest man in America. And yet, as I said in the beginning, all this represents only one side of his nature: he reads his chapter in the Bible each evening by his family fireside, and tenderly kisses his grandchildren good night.

The individual who imagines that embezzlers are all riotous in nature, and by habit spendthrifts, does not know humanity. The embezzler is one man; the model

citizen another, and yet both souls reside in the one body.

Nero had a passion for pet pigeons, and the birds used to come at his call, perch on his shoulder and take dainty crumbs from his lips.

The natures of some men are divided up into water-tight compartments. Sir Isaac Newton kept his religion in one compartment, and his science in another—they never got together.

Voltaire says, "When Sir Isaac Newton discovered the Law of Gravitation he excited the envy of the learned men of the world; but they got even with him when he wrote a book on the prophecies of the Bible."



HEN Newton was only twenty-seven years old he was elected Lucasian Professor of Mathematics of Trinity, an office that carried with it a goodly salary and also much honor. Never before had so young a man held this chair.

Newton was a pioneer in announcing the physical properties of light. Every village photographer now fully understands this, but when Newton proclaimed it he created a whirlwind of disapproval. When a man at that time put forth an unusual thought it was regarded as a challenge. Teachers and professors all over Great Britain, and also in Germany and France, set about to show the fallacy of Newton's conclusions.

Newton had issued a pamphlet with diagrams show-

ing how to study light, and the apparatus was so simple and cheap that the "Newton experiments" were tried everywhere in schoolrooms.

People always combat a new idea when first presented, and so Newton found himself overwhelmed with correspondence. Cheap arguments were fired into Cambridge in volleys. These were backed up by quibbling men—Pro Bono Publico, Veritas and Old Subscriber—men incapable of following Newton's scientific mind. In his great good-nature and patience Newton replied to his opponents at length.

His explanations were construed into proof that he was not sure of his ground. One man challenged him to publicly debate the matter, and we hear of his going up to London, king that he was, to argue with a commoner ✍ ✍

Such terms as "pretender," "upstart," "falsifier," were freely used, and poor Newton for a time was almost in despair. He had thought that the world was anxious for truth! Some of his fellow-professors now touched their foreheads and shook their heads ominously as he passed. He had gone so far beyond them that their cries of "whoa!" were unnoticed.

It is here worth noting that the universal fame of Sir Isaac Newton was brought about by his rancorous enemies and not by his loving friends. Gentle, honest, simple and direct as was his nature, he experienced notoriety before he knew fame. To the world at large he was a "wizard" and a "juggler" before he was acknowledged a teacher of truth—a man of science.

¶ When the dust of conflict concerning Newton's announcement of the qualities of light had somewhat subsided, he turned to his former discovery, the Law of Gravitation, and bent his mighty mind upon it. The influence of the moon upon the Earth, the tilt of the Earth, the flattening at the poles, the recurring tides, the size, weight and distance of the planets now occupied Newton's attention. And to properly study these phenomena he had to construct special and peculiar apparatus

In 1687 the results of his discoveries were brought together in one great book, the "Principia." Newton was then forty-five years old. He was still the Cambridge professor, but was well known in political circles in London on account of having been sent there at various times to represent the University in a legal way. ¶ His diplomatic success led to his being elected a member of Parliament. Among other great men whom he met in London was Samuel Pepys who kept a diary and therein recorded various important nothings about "Mr. Isaac Newtown of Cambridge—a school-teacher of degree, with a great dignity of manner and pleasing Countenance." It seems Newton thought so well of Pepys that he wrote him several letters, from which Samuel gives us quotations. Pepys really claimed the honor of introducing Newton into good society.

Among others with whom Newton made friends in Parliament was Mr. Montague, who shortly after became Secretary of the Exchequer. Montague made his friend Newton a Warden of the Mint, with pay about

double that which he had received while at Cambridge.

¶ In this public work Newton brought such talent and diligence to bear that in 1697 he was made Master of the Mint, at a salary of fifteen hundred pounds a year —a princely sum in those days.

There is no doubt but that the fact that Newton was a devout Churchman and an upholder of the Established Order, was a great although perhaps unconscious diplomatic move. His delightful personality—gracious, suave, dignified and silent—won for him admiration wherever he went. In argument his fine reserve and excellent temper were most convincing. Had he turned his attention to the law he would have become Chief Justice of England.

In 1703 he was elected President of the Royal Society, an office he held continuously for twenty-five years, and which tenure was only terminated by his death.

¶ In 1705 the Queen paid a visit to Cambridge, and there with much pageantry the honor of Knighthood was bestowed that changed Professor Newton into Sir Isaac Newton.

But the man himself was still the simple, modest gentleman. The title did not spoil him—he was a noble man from boyhood.

His duties as Master of the Mint did not interfere with his studies and scientific investigations.

He revised and rewrote his "Principia," and in 1713 the new edition was issued. One copy was most sumptuously bound, and Sir Isaac, who was a special favorite at court, presented it to the Queen in person. Those

who are interested in such things, by applying to the Curator of the British Museum may see and turn the leaves of this book, reading the gracious inscription of the author, while a solemn man in brass buttons stands behind ❧ ❧

Newton died March 20, 1727, aged eighty-five, and was buried in Westminster Abbey.

The verdict of humanity concerning Sir Isaac Newton has been summed up by Laplace thus: HIS WORK WAS PRE-EMINENT ABOVE ALL OTHER PRODUCTS OF THE HUMAN INTELLECT.

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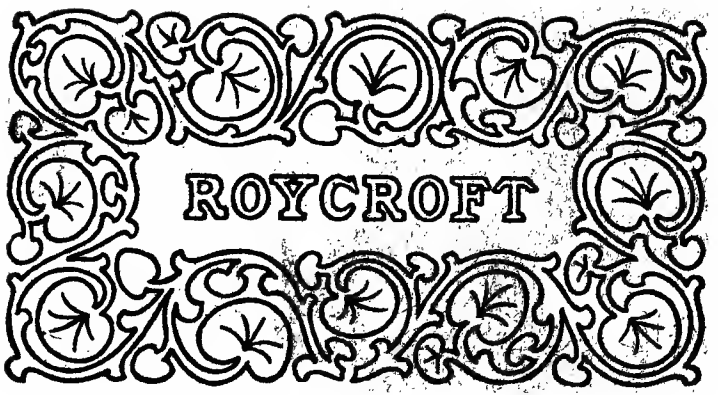
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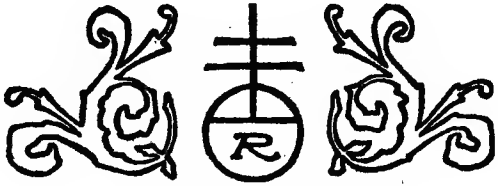
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HUMBOLDT



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Humboldt



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HUMBOLDT

THE actual miracle of the Universe is the invariableness of Law. Under like conditions a like result must follow, and upon this rock is the faith of the Scientist built. —THE COSMOS



Humboldt

HUMBOLDT

THE Baron and Baroness von Hollwede were not happily married. The Baroness had intellect, spirit, aspiration, with an appreciation of all that was best in art, music and the world of thought. As to the Baron, he had drunk life's wine to the lees and pronounced the draught bitter. He was a heavy dragoon with a soul for foxhounds. Later, when gout got to twinging him, he contented himself with cards and cronies. ¶ And then Destiny, like a novelist who does not know what to do with a character, sent him on an excursion across the River Styx.

This was a good move all 'round, and the only accommodating action in which the Baron ever had a part. He left a large estate, not being able to take it with him. ¶ There are two kinds of widows, the bereaved and relieved.

In India no widow is allowed to remarry. The canons of the Episcopal Church forbid any widow or widower to remarry whose former partner is living. A member of the Catholic Church who makes a marital mistake is not allowed to rectify it.

Yet Nature, sometimes, as if to prove the

foolishness of fearsome little man, justifies that of which man hotly disapproves.

To be a widow of thirty-six, fair of face and comely in form, to own a beautiful home and have an income greater than you can spend, and still not enough to burden you—what nobler ambition!

The Baroness had a little encumbrance—a son aged ten. I would like to tell of his career, but alas, of him history is silent, save that he was heir to some of his father's proclivities, grew up, became an army officer and passed into obscurity in middle life, dishonored and unswung.

Such a widow as the Baroness von Hollwede is not apt to mourn for long. She was courted by many, but it was Major Humboldt who found favor in her heart. I assume that all of my gentle readers have in them some of the saltness of time, so details can safely be omitted—let imagination bridge the interesting gap.

¶ The Major was a few years younger than the lady, but like the gallant gentleman that he was, he swore i' faith before the notary that they were of the same age, just as Robert Browning did when officially interrogated as to the age of Elizabeth Barrett. Thomas Brackett Reed avowed that no gentleman ever weighed over two hundred pounds, and I also maintain no gentleman ever married a woman older than himself.

¶ The marriage of Major Humboldt and the Baroness von Hollwede was a most happy mating that fully justified the venture. The Major had done his work bravely in the Seven Years' War, and was now an at-

tache of the King's Court—a man of means, of intellect and many strong and beautiful virtues. After the marriage he became known as Baron von Humboldt, and as to just how he succeeded to the noble title let us not be curious—undoubtedly his wife bestowed it on him, good and generous woman that she was.

They lived in the romantic Castle Tegel, near Berlin, and separated from the city by a park, where the dark pines still tower aloft and murmur their secrets to the night breeze. Tegel is a most beautiful place; it was first a hunting-lodge occupied by Frederick the Great. It is shut out from the world by its high stone walls, and in its dim, dense woods, one might easily imagine he was far indeed from the madding crowd.

Here there were two sons born to the Baron and Baroness—two years apart. One of these sons sleeps now beneath the turret where he first saw the light, and from which he made others see the light as long as he lived.

In Gœthe's "Faust" is an allusion to a mysterious legend that had its rise in storied Tegel. On May 18th, 1778, Gœthe came here, walking over from Berlin, dined, and walked on to Potsdam. But before he left he saw two beautiful boys, aged eight and ten, playing beneath the spreading Tegel trees. The boys remembered the event and wrote of it in their journal, mentioning the kindly pats on their heads and the prophecy that they would grow up and be great men.

Gœthe was always patting boys on the head and saying graceful things, and it is doubtful whether his

prophecy was more than a commonplace. But Gœthe always claimed it was divine prophecy.

These boys were William and Alexander von Humboldt ❧ ❧

History does not supply another instance of two brothers attaining the intellectual height reached by Alexander and William von Humboldt.

This being so, it seems meet that we should tarry a little to inspect the method adopted in their education —a thing which the educated world for the most part has not done.

THIS world of ours, round like an orange and slightly flattened at the poles, has produced only five educated men. Of course all education is comparative; but these five are so beyond the rest of mankind that they form a class by themselves.

¶ An educated man means a developed man—a man rounded on every side of his nature. We are aware of no limit to which the mind of man may evolve; other men may appear who will surpass the Immortal Five, but this fact remains: none that we know have.

Great men, so-called, are usually specialists—clever actors, individuals with a knack, talented comedians—who preach, carve, paint, orate, fight, manipulate, manage, teach, write, perform, coerce, bribe, hypnotize, accomplish, and get results. There are great mathematicians, financiers, sea-captains, foot-ball

players, engineers, bishops, wrestlers, runners, boxers, and players on sweet zithern strings. But these are not necessarily great men any more than poets, painters, and pianists with wonderful hirsute effects and strange haberdashery are great men.

It is intellect and emotion expanded in every direction that gives the true title to greatness. Judged in this way, how rare is the educated man—five in six thousand years! And yet one of these five educated men had a brother nearly as great as he. Alexander von Humboldt was past fifty before the world of thinking men realized that he had outstripped his brother William—and Alexander would never admit he had.

¶ These two men, handsome in face, form and feature—strong in body and poised in mind, with souls athirst to realize and know—happy men, living long lives of useful effort—surely should be classed as educated persons.

And in passing, let us note that all education is preparatory—it is life that gives the finals, not college. The education of the Von Humboldt boys was the Natural Method—the method advocated by Rousseau—the education by play and work so combined that study could never become irksome nor work repulsive. Rousseau said "Make a task repugnant and the worker will forever quit it as soon as the pressure that holds him to it is removed."

The parents of William and Alexander von Humboldt carefully studied the new plan of education that was at that time being advocated by some of the best pro-

fessors at Berlin. "A child must have a teacher," said Jean Jacques, "but a professional teacher is apt to become the slave of his profession, and when this occurs he has separated himself from life, and therefore to that degree is unfitted to teach."

A school should not be a preparation for life—a school should be life. The Kindergarten Idea, among other things, suggests that a child should never know he is in school. The discipline is kept out of sight, and the youngster finds himself a part of the busy life. He blends in with the others, and works, plays and sings under the wise and loving care of his "other mother," the teacher. He is living, not simply preparing to live.

¶ All life should be joyous, spontaneous, natural. The Rousseau Idea, modified and refined by Froebel, is the utilization of the propensity to play.

Major von Humboldt found a man who was saturated with the true Froebel spirit, although this was before Froebel was born. The man's name was Heinrich Campe. He was hired to superintend the education of the Humboldt boys. That is to say, he was to become their comrade, friend, counsellor, fellow-scholar, playmate and teacher.

Play needs direction as well as work.

Campe played with the boys. They lived with Nature —made lists of all the trees at Tegel, drew sketches of the leaves and fruit, calculated the height of trees, measured them at the base, and occasionally cut down trees, first sitting in judgment on the case and deciding why a certain tree should be removed, thus getting a

lesson in scientific forestry. They became acquainted with the bugs, beetles, birds and squirrels. They cared for the horses, cattle and fowls, and best of all they learned to wait on themselves.

Campe told them tales of history—of Achilles, Pericles and Cæsar. Then they studied Greek that they might read of Athens in the language of the men who made Athens great. They translated "Robinson Crusoe" into German, and Campe's translation of "Robinson Crusoe" is today a German classic. It was all natural—easy, interesting. The day was filled with work and play, and joyous tales of what had been said by others in days agone.

"Teach only that which you know and never that which you merely believe," said Rousseau.

There is still a cry that religion should be taught in the public schools. If we ask "What religion?" the answer is, "Ours, of course!"

Religious dogma, being a matter of belief, was taught to the Humboldts as a part of history. So these boys very early became acquainted with the dogmas of Confucianism, Mohammedism and Christianity. They separated, compared and analyzed, and saw for themselves that dogmatic religions were all much alike. To know all religions is to escape slavery to any. In studying the development of races these boys saw that a certain type of religion fits a certain man in a certain stage of his evolution, and so to that degree religion is necessary.

An ethnologist is never a Corner Grocery Infidel.

The C. G. I. is very apt to be converted at the first revival, outrivaling all other "seekers," and when warm weather comes, falling from grace and dropping easily into scofferdom. The Humboldts, like Thoreau, never had any quarrel with God, and they were never tempted to go forward to the Mourners' Bench. Origin and destiny did not trouble them; predestination and justification by faith were not in their curriculum; foreordination and baptism were to them problems not to be taken seriously.

By studying religions in groups and incidentally, they learned to distinguish the fetich in each. They read Greek mythology side by side with Judean mythology and noted the similarities.

The intent of Tutor Campe was to give these boys a scientific education. Science is only classified common sense. To be scientific is to know differences—to distinguish between this and that. Every successful farmer has traveled a long way into science, for science deals with the maintenance of life. To know soils, animals and vegetation is to be scientific.

But when the average farmer learns to transmute compost into grass and grain, and these into beef, he usually stops, content.

To be a scientist in the true sense, one must love knowledge for its own sake, and not merely for what it will bring on market-day, and so the Humboldts were led on through the stage of wanting to make money, to the stage of wanting to know the why and wherefore.

¶ It will be seen that the education of the Humboldts

was what the Boylston Professor of English at Harvard calls "fadism, or the successful effort at flabbiness." Our Harvard friend thinks that education should be a discipline—that it should be difficult and vexatious, and that happiness, spontaneity and exuberance are the antitheses and the foes of learning. To him grim earnestness, silence, sweat and lamp smoke are preferable to sunshine, and joyous, useful work so wisely directed that the pupil thinks it play. He believes that to be sincere we must be serious.

In these latter-day objections there is nothing new. Socrates met them all; Rousseau heard the cry of "fad;" Heyne, Pestalozzi, Campe, Knuth and Froebel met the carpist and answered him reason for reason, just as Copernicus, Bruno and Galileo told why the earth revolved.

The professional teacher who can do nothing but teach—the college professor who is a college professor and nothing else—hates the Natural Method man as the person who wears a paste diamond hates a lapidary.

HEINRICH CAMPE was the tutor of the Humboldts for two years, when he entered the employ of the King as Commissioner of Education. After this, however, he continued to spend one day a week at Tegel for some time. He loved the boys as his own and his hope for their future never relaxed. Possibly his interest was not wholly disinterested—with

the help of these lads he was working out and proving his pedagogic theories.

When Campe resigned his immediate tutorship he was allowed to select his successor, and he chose a young man by the name of Christian Knuth.

The mother was a member of this little university of four persons ; Knuth, of course, was a member, for he always considered himself more of a student than teacher. When Campe resigned in favor of Knuth his action was in degree prompted by his love and consideration for the boys. Knuth was only a little past twenty, and was able to enter into the out-of-door sports and work of the youngsters better than the older man. Knuth was their hero—together they rode horseback, climbed mountains, excavated tunnels, mined for ore, built miniature houses. " Knuth made every good thing in Berlin available to us," wrote William years afterward—" we visited stores, factories, barracks and schools, and became familiar with a thousand commonplace things never taught in schools and colleges."

¶ When Alexander was twelve years old, the father died. This would have been a severe blow to the boys were it not for Knuth, who seemed to stand to them more as the real parent than did Major von Humboldt.

¶ Knuth was a business man of no mean ability. The Baroness now trusted him with all of her financial affairs. He called on the boys to help him in the details of business, so the keeping of accounts and the economical handling of money were lessons they learned early in life.

When Alexander was seventeen and William nineteen, the mother and Knuth decided that the boys should have the advantages of university life. Accordingly they were duly entered at the University of Frankfort as "special students." Knuth also entered as a student in the class with them. Special students, be it known, are usually those who have failed to pass the required examinations.

In this instance, William and Alexander were beyond many of their classmates in some things, but in others they were deficient. Especially had their education in the dead languages been "neglected," so it is quite likely they could not have passed the examinations had they attempted it. It should also be explained that special students are not eligible to diplomas or degrees.

But Campe and Knuth did not believe the nerve-racking plan of examinations wise, any more than it is wisdom to pull up a plant and examine the roots to see how it prospers. Neither did they prize a college degree. They knew full well that a college degree is no proof of excellence of character; to them a degree was too cheap a thing to deviate in one's orbit to secure. They were after bigger game.

At Frankfort, Knuth and his charges lived in the family of Professor Loffler, "so as to rub off a little knowledge from this learned man." They studied history, law, political economy, philosophy and natural history. We would say their method was desultory were it not for the fact that they were always thorough in all that

they undertook. They were simply three boys together, intent on getting their money's worth. William was a little better student than Alexander, and was the leader; he was larger in stature and seemed to have more vitality.

Two years were spent at the University of Frankfort, and then our trio moved on to the University of Gottingen where there were distinguished lecturers on Natural History and Archæology. Antiquity especially interested the boys, and the evolution and history of races were followed with animation.

William took especially to philosophy as expressed in the writings of Kant, while Alexander developed a love for botany and what he called "the science of out-of-doors."

Two years at Gottingen, following the bent of their minds and listening only to those lectures they liked, and they moved on to Jena. Here they were in the Gœthe country. Soon there were overtures from Berlin that they enter the service of the Government. These overtures were set in motion by Campe, who, however, kept out of sight in the matter, and when accused, stoutly declared that it was every man's duty to help himself, and that he personally had never helped any one get a position and never would.

William was twenty-three, Alexander twenty-one. William was gracious and graceful in manner and made himself at home in the best society; Alexander was studious, reserved and inclined to be shy.

An invitation came that they should visit Weimar and

spend some weeks in that little world of art and letters created by Gœthe and Schiller. To William this was very tempting; but Alexander saw at Weimar scant opportunity to study botany and geology. Besides that, he felt that sooner or later he would drift into the employ of the Goverment, following in his father's footsteps. His ambition was practical mining, with a taste for finance.

The brothers kissed each other good-bye, and one went to Weimar to assist Schiller in editing a magazine that did not pay expenses, bask in the sunshine of the great Gœthe, and incidentally to secure a wife. The other started on a geological excursion, and this excursion was to continue through life, and make the man the greatest naturalist that the world had seen since Aristotle lived, two thousand years before.

HUMBOLDT'S first book was on the geological formation of the Rhine, published when he was twenty-six years old. The work was so complete and painstaking that it led to his being appointed "Assessor of Mines" at Berlin. This was the same office that Swedenborg once held in Scandinavia.

¶ For the benefit of our social science friends, it is rather interesting to note that at this time in Europe nearly all mines belonged to the Government. An individual might own the surface, and up to the sky, but his claim did not go to the center of the earth. Iron,

coal, copper, silver and gold were largely mined, and the Government either operated the mines direct, or else leased them on a percentage.

I am told that in America all mining is done by individuals or private companies, and that four-fifths of all mining companies have no mines at all—merely samples of ores, blue-prints, photographs and prospects. The genus promoter is a very modern production and is a creation Humboldt never knew; the "salting" of mines was out of his province, and mining operations carried on exclusively in sky-scrapers was a combination he never guessed.

Whether society will ever take a turn backward and the whole people own and control the treasures deposited by Nature in the earth, is a question I will leave to my Marxian colleagues to determine.

As a mine manager Humboldt was hardly a success. He knew the value of ores, utilized various by-products that had formerly been thrown away, made plans for the betterment of his workers, and once sent a protest to the King against allowing women and children to be employed under ground.

But the cost per ton of his product was out of proportion to expenses. While other men mined the ore he wrote a book on "Subterranean Vegetation." The details of business were not to his liking. His own private financial affairs were now turned over to Knuth, his modest fortune resolved into cash and invested in bonds that brought a low rate of interest. Freedom was his passion—to come and go at will was his de-

sire. The thirst for travel was upon him—travel, not for adventure, but for knowledge.

He resigned his office and tramped with knapsack on back across the Alps. The habit of his mind was that of the naturalist investigator. Geology, botany and zoology were his properties by divine right. These sciences really form one—geognosy, or the science of the formation of the earth. The plants dissolve and disintegrate the rocks; the animal feeds upon the plants; and animal life makes new forms of vegetation possible. So the mineral, vegetable and animal kingdoms evolve together, constantly tending toward a greater refinement and complexity.

The highest form of animal life is man; and the highest type of man is evolved where there is a proper balance between the animal and vegetable kingdoms. ¶ Humboldt discovered very early in his career that the finest flowers grow where there are the finest birds, and man separated from birds, beasts and flowers could not possibly survive.

About this time Humboldt, taking the cue from Gœthe, said, "Man is a product of soil and climate, and is brother to the rocks, trees and animals. He is dependent on these, and all things seem to point to the truth that he has evolved from them. The accounts of special creation are interesting as archæology, but biology is distinctly the business of modern scientists. The scientist tells what he knows, and the theologist what he believes."

And again we find Humboldt writing from Switzer-

land in 1796, making observations that have been recently unconsciously paraphrased by the United States Secretary of Agriculture who said in a printed report, "Western farmers who raise and sell hogs and cattle, feeding them grain instead of selling it, are sure to acquire a competence. The farmers who sell grain are the ones who do not pay off their mortgages."

Says Humboldt, "Here on the sides of these towering and forbidding mountains we find the most fertile and beautiful miniature farms, nestling in little valleys or on plateaus. Indeed, I heard today of a man falling out of his farm and being seriously injured. He ventured too near the edge. These Swiss gardens with their prosperous and intelligent owners are only possible through the fact that the owners keep all the cows and poultry that can comfortably exist on the acres. The peasants sell butter, cheese and eggs, instead of grain and vegetables exclusively. They give back to the earth all that they take from it, so in the course of a hundred years a fine soil evolves that supports valuable animals, including valuable men; choice fruit, flowers and birds appear, and we have what we are pleased to call Christian civilization. It is not for me to quibble about terms, but civilization is not necessarily Christian, since it is more a matter of economics and natural science than religion."

Where the climate is fairly propitious, but not so much so but that it compels watchfulness, economy and effort, man will work, and to aid him in his work he utilizes domestic animals. And the act of domesti-

cating the animal domesticates the man. As man improves the animal, he improves himself. One reason the American Indian did not progress was because he had neither horses, camels, oxen, swine nor poultry. He had his dog, and the dog is a wolf, and always remains one, in that his intent is on prey. This fitted the mood of the Indian and he continued to live his predacious career without a particle of evolution. To stand still is to retreat, and there is evidence that long before the year 1492, there was a North American Indian that was a better Indian than the Indians who watched the approach of Columbus and exclaimed, "Alas! we are discovered."

In crossing the Alps, Humboldt was impressed with the truth that man was a necessary factor in working out "creation," just as much as the earthworm. When men stir the soil so as to make it produce grain that the family may be fed, and utilize animals in this work, civilization is at hand. Nations with a controlling desire to absorb, annex and exploit are still to that degree savages. Creation still is going on, and this earth is becoming a better and more beautiful place as men work in line with reason and allow science to become the handmaid of instinct.

Humboldt, above all men, prepared the way for Darwin, Spencer and Tyndall—all of these built on him, all quote him. His books form a mine in which they constantly delved.

Humboldt in boyhood formed the habit of close and accurate observation, and he traveled that he might

gratify this controlling impulse of his life—the habit of seeing and knowing. His genius for classification was superb; he approached every subject with an open mind, willing to change his conclusions if it were shown that he was wrong; he had imagination to see the thing first with his inward eye; he had the strength of body to endure physical discomfort, and finally he had money enough so he was free to follow his bent. These qualifications made him the prince of scientific travelers—the pioneer of close, accurate and reliable explorers.

BEFORE Humboldt's time travelers had been mostly of the type of Marco Polo and Sir John Mandeville, who discovered strange and wondrous things, such as horses with five legs, dogs that could talk, and anthropopagi whose heads did grow beneath their shoulders. The temptation to be interesting at the expense of truth has always been strong upon the sailor-man. Read even the history of Christopher Columbus and you will hear of islands off the coast of America inhabited exclusively by women who had only one calling-day in a year when their gentlemen friends from a neighboring island came to see them.

The world needed accurate, scientific knowledge concerning those parts of the world seldom visited by man. Travel a hundred years ago was accompanied by great

expense and more or less peril. Nations held themselves aloof from each other, and travelers were looked upon as renegades or spies.

Alexander von Humboldt had explored mines, climbed mountains, visited that strange people, the Basques of Spain, got little glimpses into Africa where the jungle was waiting for a Livingstone and a Stanley before giving up its secrets.

The Corsican had thrown Europe into a fever of fear, and war was on in every direction, when in 1799 Humboldt ran the blockade and sailed out of the harbor of Corunna on the little corvette "Pizarro," bound for the Spanish possessions in the New World. Spain had discovered America in the gross two hundred years before, but what this country really contained in way of possibilities, Spain had most certainly never discovered.

Humboldt's mind conceived the idea of a Scientific Survey, and in this he was the maker of an epoch. In this undertaking he secured the assistance of the Prime Minister who secretly issued passports and letters of recommendation to Humboldt, first cautioning him that if the Court at Madrid should know anything about this proposed voyage of discovery it could never be made, so jealous and ignorant were the officials. Only one thing did Spain have in abundance, and that was religion.

At that time the Spanish Colonies included Louisiana, Florida, Texas, California, Mexico, Central America, Cuba, most of the West Indies, and the most of South

America, not to mention the Philippines. These colonies covered a territory stretching over five thousand miles from North to South.

Twice a year Spain sent out trading ships, convoyed by armed cruisers. Trade then was monopoly and extortion. The goods sent out were as cheap and tawdry as could be palmed off; and all that were brought back were bartered for at the lowest possible prices. Cheating in count, weight and quality was considered perfectly proper, and as the Government officials at home got a goodly grab into all transactions in way of perquisites all went swimmingly—or fairly so.

For a Spainard to trade with any other nation was treason and if caught, his property was confiscated and probably his head forfeited. No foreigners were allowed in the colonies, and exclusion was the rule. To hold her dependencies Spain thought she must keep them under close subjection; and she seemed beautifully innocent of the fact that she was the dependent, not they. She did not believe in Free Trade.

¶ The Government was absolutely under military rule. Of the botany, zoology, geology, not to mention the topography of her American posessions, the officials of Spain knew nothing save from the tales of sailors.

Such were Spanish conditions when Humboldt got himself smuggled on board the "Pizarro" and sailed away June, 4th, 1799.

With Humboldt was one companion, Bonpland, a Swiss by birth, and a rare soul. Humboldt was a naturalist and a philosopher and by nature he was a trav-

eler. But he lacked that intrepid quality possessed by, say, Lewis and Clarke. He had too much brain—too fine a nerve-quality to face the forest alone. Bonpland made good all that he lacked. He used to call Bonpland his "Treasure." And surely such a friend is a treasure, indeed. Bonpland was a linguist, as most of the Swiss are. He was a mountain climber, and had been a soldier and sailor, and he knew enough of literature and science so he was an interesting companion. He was small in stature, lithe, immensely strong, absolutely fearless, and had left behind him neither family nor friends to mourn his loss. To Humboldt he was guide, teacher, protector and friend. Bonpland was the soul of unselfishness.

Perhaps a certain quality of man attracts a certain quality of friend—I really am not sure. But this I know, that while Alexander von Humboldt had few personal friends, he always had just those which his nature required—his friends were hands, feet, eyes and ears for him, to quote his own words.

This voyage on the "Pizarro" occupied five years. The travelers visited Teneriffe, Cuba, Mexico, and skirted the coast of South America, making many little journeys inland. They climbed mountains that had never been scaled before; they ascended rivers where white men had never been, and pushed their way through jungle and forest to visit savage tribes who fled before them in terror thinking they were gods. On the return trip they visited the United States; spending some weeks in Washington, where they were

the guests of the President, Thomas Jefferson. A very firm friendship sprang up between Humboldt and Jefferson: they were both freethinkers, and when Humboldt recorded in his journal that Jefferson was by far the greatest man in America, he not only recorded his personal conviction, but he spoke the truth. And as if not to be outdone, although he did not then know what Humboldt had said of him, Jefferson declared that Alexander von Humboldt was the greatest man he ever saw.

Most of the vast number of specimens and natural history curiosities gathered by Humboldt and Bonpland were placed on a homeward bound ship that sailed from South America. This ship was lost and all the precious and priceless cargo went for naught. Had Humboldt and his companion sailed on the ship, as they first intended, instead of returning by way of the United States, the world would not have known the name of Alexander von Humboldt.

WHEN Humboldt landed at Bordeaux in August, 1804, after his five-years' journey, he immediately set out to visit his brother who was then the German Ambassador at Rome.

We can imagine it was a most joyous meeting. Of it William said, "I could not recognize him for my tears—but beside this he seemed to have grown in stature and was as brown as a Malay. Was he really

brother? Ah, the hand was the hand of Esau, but when he spoke, it was the same, gentle, loving voice —the voice of my brother."

A few weeks at Rome and Alexander grew restless for work. He had made great plans about publishing the record of his travels. This work was to outstrip anything in book-making that the world had ever seen, dealing with similar subjects. The writing was done on ship-board, by camp-fires, and in the forest and jungle, but now it had all to be gone over and revised and much of it translated into French, for the original notes were sometimes in English and sometimes in German.

Only in Paris could the work of book-making be done that would fill Humboldt's ideals. In Paris were printers, engravers, artists, binders—Paris was then the artistic center of the world, as it is today.

The result of this first great scientific voyage of discovery was written out in a work of seventeen volumes. It was entitled, "The Travels of Humboldt and Bonpland in the Interior of America." Humboldt wrote the book, but he wanted his friend to have half the credit. This superb set of books, containing many engravings, was issued under Humboldt's supervision and almost entirely at his own expense. It was divided into five general parts: Geography and the Distribution of Plants; Zoology and Comparative Anatomy; Political Essays and Description of Peoples and Institutions in the Kingdom of New Spain; Astronomy and Magnetism; Equinoctial Vegetation.

It took two years to issue the first volume, but the others then came along more rapidly, yet it was ten years before the last book of the set was published. ¶ The total expenditure required in issuing this set of books was over a million francs, or to be exact, two hundred and twenty-six thousand dollars.

The cost of a set of these books to subscribers was two thousand five hundred and fifty dollars, although there were a few sets containing hand-colored plates and original drawings that were valued at twenty thousand dollars. One such set can now be seen at the British Museum. In all only three hundred sets of these books were issued. One set at least came to America, for it was presented to Thomas Jefferson, and I believe is now in the Congressional Library.

This American Expedition fixed Humboldt's place in history, but after its completion and the record was written out he had still over half a century to live.

ALEXANDER VON HUMBOLDT was an atheist at a time when few men could afford the luxury. Very fortunately he had sufficient fortune to place him beyond the reach of the bread-and-butter problem, and his books were written in the language of the esoteric. He did not serve as an iconoclast for the common people—his name was never on the tongue of rumor—comparatively few, indeed, knew of his existence. His books were issued in de luxe limited edi-

tions, and were for public libraries, the shelves of nobility, or rich collectors.

Humboldt was judical in all of his statements, approaching every question as if nothing were known about it. He built strong and was preparing the way, throwing up ramparts and storing ammunition for the first decisive battle that was to take place between Theology and Science. In his day Theology was supreme, the practical dictator of human liberties. But a World's Congress of Freethinkers has recently been held in Rome. There were present over three thousand delegates, representing every civilized country on the globe. The deliberations of the Congress were held in a hall supplied by the Italian Government, and all courtesies and privileges were tendered the delegates. ¶ The only protest came from the Pope who turned protestant and ordered special services in all the Catholic churches of Rome "to partially mitigate the blot upon the fair record of the Holy City." Forty years ago armed men would have routed this Congress by force, and a hundred years ago the bare thought of such a meeting would have placed a person who might have suggested it in imminent peril.

Humboldt prophesied that the world would not forever be ruled by religious superstition—science must surely win. But he did not expect that the change would come so quickly as it has; neither did he anticipate the fact that orthodox religion would admit the facts of science and still flourish. The number of Church communicants now is larger than it was in

Humboldt's time. The Church is a department store that puts in the particular goods that the people ask for. Freethinkers do not leave the Church; the Church is built on a Goodyear patent, and its lines expand when Freethinkers get numerous, so as to include them. The Church would rather countenance vice, as it has in the past, than disband. In New York City we now have the spectacle of the Church operating a saloon and selling strong drink. In all country towns, religion failing in being attractive, to keep churches alive, resort is had to raffles, lotteries, concerts, chicken-pie socials, and lectures and exhortations by strange men in curious and unique garb, and singers of reputation.

The Church, being a part of society, evolves as society evolves. Christianity is a totally different thing now from what it was in Humboldt's time—it was a different thing in Humboldt's time from what it was a hundred years before.

Behold the spectacle of a thousand highly educated and gentle men, from all over the world, decorating with garlands the statue of Bruno in Rome, on the site where Churchmen piled high the fagots and burned his living body!

I foretell that when the next World's Congress of Freethinkers occurs in Rome, the Pope will welcome the delegates and their deliberations will occur by invitation in the wide basilica of St. Peter's.

The world moves, and the Pope and all the rest of us move with it.

When a meeting was recently called in Jersey City to welcome Turner, the so-called anarchist, the Mayor forbade the meeting and placed a cordon of policemen around the intended meeting-place. But lo, in their extremity the "anarchists" were invited by a clergyman to come and use his church and he led the way to the sacred edifice, warning the police to neither follow nor enter. As we become better we meet better preachers.

Humboldt could see no rift through the clouds outside of the death of the Church and the disbanding of her so-called sacred institutions. We now perceive that very rarely are religious opinions consciously abandoned; they change, are modified and evolve into something else. Churches are now largely social clubs. In America this is true both of Catholic and Protestant. All denominations are interested in social betterment because the trend of human thought is in that direction. The Church is being swept along upon the tide of time. In a few instances churches have already evolved practical industrial betterments, conducted directly under the supervision of the church and in its edifice. There are hundreds of Kindergartens now carried on in church buildings that a few years ago were idle and vacant all the week. Others have sewing circles and boys' clubs, and these have metamorphosed in some instances into Manual Training Schools where girls are taught Domestic Science and boys are given instruction in the Handicrafts.

I know a church that derives its support from the sale of useful things that are made by its members and

workers under the supervision of its pastor who is a master in handicraft. So this pretty nearly points the ideal—a church that has evolved into an ethical and industrial college, where the pastor is not paid for preaching, but for doing.

Charles Bradlaugh once said, "A paid priesthood blocks evolution. These men are educated to uphold and defend the institution. They can do nothing else. Most of them have families dependent upon them—do you wonder that it is a fight to the death! It is not truth that the clergy struggles for—they may think it is—but the grim fact remains, it is a fight for material existence."

We all confuse our interests with the eternal verities—the thing that pays us we consider righteous, at least justifiable. This is the most natural thing in the world.

An artist who painted very bad pictures once took one of his canvases to Whistler for criticism.

Jimmie shrugged his shoulders and made a grimace that spoke volumes.

"But a man must live some way!" pleaded the poor man in his extremity.

"I do not see the necessity," was the weary reply.

¶ Preachers must live; their education and environment has unfitted them for useful effort; but they are a part of the great seething struggle for existence. And so we have their piteous and plaintive plea for the obsolete and the outworn.

Disraeli once in an incautious moment exclaimed, "If

we do away with the Established Church what is to become of the fourteen million prepared and pickled sermons? Think for a moment of the infinite labor of writing new sermons based upon a different point of view—let us be reasonable and not subject an overworked profession to the humiliation of destroying the bulk of its assets."

Science deals directly with the maintenance of human life and the bettering of every condition of existence through a wider, wiser and saner use of the world. ¶ Civilization is the working out and comprehending and proving how to live in the best way. Theology prepares men to die; science fits them to live. Science deals with your welfare in this world; theology in another

Theology has not yet proved that there is another world—its claims are not even based upon hearsay. It is a matter of belief and assumption.

Science, too, assumes, and its assumption is this: The best preparation for a life to come is to live here and now as if there were no life to come. Your belief will not fix your place in another world—what you are, may. The individual who gets most out of this life is fitting himself to get most out of another if there is one

And this brings us up to that paragraph in the Cosmos where Humboldt says, "I perceive a period when the true priesthood will not be paid to defend a fixed system of so-called crystallized truth. But I believe the time will come when that man will be most revered

who bestows most benefits here and now. The clergy of Christendom have long stood as the leaders of thought, but to hold this proud position they must abandon the intangible and devote themselves to this world and the people who are alive."

MOST of Humboldt's time during his middle life was spent at Paris where he was engaged in the herculean task of issuing his splendid books. However, he varied his work, so several hours daily were devoted to study and scientific research; and from time to time he made journeys over Europe and Asia.

In 1827 a personal request came from the King of Prussia that Humboldt should thereafter make Berlin his home. He was too big a man for Germany to lose. ¶ He acceded to the King's request, moved to Berlin and was spoken of as "The First Citizen," although he would not consent to holding office, nor would he accept a title. In vexed questions of diplomacy he was often consulted by the King and his Cabinet, and in many ways he furthered the interests of education and civilization by his judicial and timely advice.

He was always a student, always an investigator, always a tireless worker. He lived simply and quietly—keeping out of society and away from crowds, excepting on the rare occasions when necessity seemed to demand it.

The quality of the man was well mirrored in those magnificent books—all that he did was on the scale of grandeur.

His books were too high in price for the average reader but on the request of the King he consented to give a course of five, free, popular lectures for the people.

No one foresaw the result of these addresses.

The course was so successful that it extended itself into sixty-one lectures, and covered a period of over ten years' time. No admittance was charged, free tickets being given out to applicants. Very soon after the first lecture a traffic sprang up in these free tickets, carried on by our Semitic friends, and the tickets soared as high as three dollars each. Then the strong hand of the Government stepped in—the tickets were cancelled, and the public was admitted to the lectures without ceremony. Boxes, however, were set apart for royalty and foreign visitors, some of whom came from England, Belgium, Switzerland and France. The size of these audiences was limited simply by the capacity of the auditorium—the attendance at first being about a thousand; later a larger hall was secured and the attendance ran as high as four thousand persons at each address.

The subjects were as follows:

Three lectures on the History of Science.

Two on reasons why we should study Science.

Four on the Crust of the Earth, and the nature of Volcanoes and Earthquakes.

Two on the form of the Earth's Surface and the elevation of the Continents.
Five on Physical Geography.
Sixteen on Astronomy.
Five on the nature of Heat and Magnetism.
Two on Mountains and how they are Formed.
Three on the nature of the Sea.
Ten on the Atmosphere as an Elastic Fluid.
Three on the Distribution of Matter.
Three on the Geography of Animals.
Three on Races of Men.

Every good thing begins as something else, and what was intended for the common people became scientific lectures for educated people. "The man who was most benefited by these lectures was myself," said Humboldt.

Men grow by doing things. Lectures are for the lecturer. Humboldt found out more things in giving these lectures than he knew before—he discovered himself. And long before they were completed he knew that his best work was embodied right here—in doing for others he had done for himself.

In attempting to reveal the Universe or "Kosmos" he revealed most of his own comprehensive intelligence. That many of his conclusions have since been abandoned by the scientific world does not prove such ideas valueless—they helped and are helping men to find the truth.

These sixty-one "popular" and free lectures make up the gigantic work known as "Humboldt's Cosmos."

SAYS Robert Ingersoll in his tribute to Alexander von Humboldt:

His life was pure, his aims lofty, his learning varied and profound, and his achievements vast.

We honor him because he has ennobled our race, because he has contributed as much as any man, living or dead, to the real prosperity of the world. We honor him because he has honored us—because he labored for others—because he was the most learned man of the most learned nation of his time—because he left a legacy of glory to every human being. For these reasons he is honored throughout the world. Millions are doing homage to his genius at this moment, and millions are pronouncing his name with reverence and recounting what he accomplished.

We associate the name of Humboldt with oceans, continents, mountains, and volcanoes—with towering palms—the wide deserts—the snow-lipped craters of the Andes—with primeval forests and European capitals—with wilderness and universities—with savages and savants—with the lonely rivers of unpeopled wastes—with peaks, pampas, steppes, and cliffs and craigs—with the progress of the world—with every science known to man, and with every star glittering in the immensity of space.

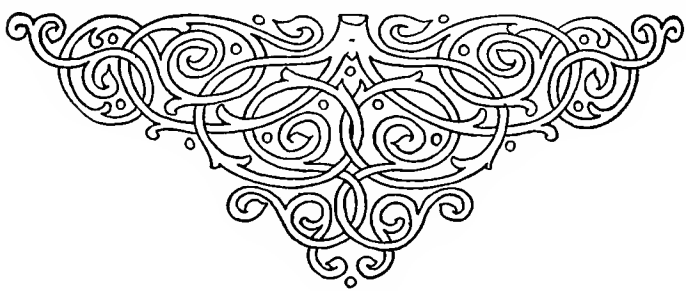
Humboldt adopted none of the soul-shrinking creeds of his day; he wasted none of his time in the stupidities, inanities and contradictions of theological metaphysics; he did not endeavor to harmonize the astronomy and geology of a barbarous people with the science of the nineteenth century. Never, for one moment, did he abandon the sublime standard of truth: he investigated, he studied, he thought, he separated the gold from the dross in the crucible of his brain. He

was never found on his knees before the altar of superstition. He stood erect by the tranquil column of Reason. He was an admirer, a lover, an adorer of Nature, and at the age of ninety, bowed by the weight of nearly a century, covered with the insignia of honor, loved by a nation, respected by a world, with kings for his servants, he laid his weary head upon her bosom—upon the bosom of the Universal Mother—and with her loving arms about him, sank into that slumber which we call Death.

History added another name to the starry scroll of the immortals.

The world is his monument; upon the eternal granite of her hills he inscribed his name, and there upon everlasting stone his genius wrote this, the sublimest of truths:

THE UNIVERSE IS GOVERNED BY LAW.



HERE ENDETH THE LITTLE JOURNEY TO THE HOME OF HUMBOLDT, AS WRITTEN BY ELBERT HUBBARD. THE BORDERS, INITIALS AND ORNAMENTS DESIGNED BY ROYCROFT ARTISTS, THE PRESSWORK BY LOUIS SCHELL, & THE WHOLE DONE INTO A BOOK BY THE ROYCROFTERS AT THEIR SHOP WHICH IS IN EAST AURORA, NEW YORK, IN APRIL OF THE YEAR MCMV

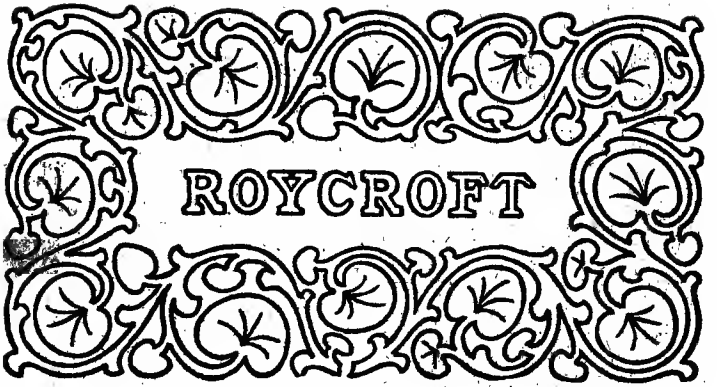


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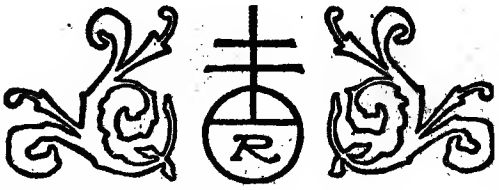
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By ELBERT HUBBARD

A SINCERE attempt to sketch the life, time, and teachings, and with truth limn the personality of The Man of Sorrows.

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¶ If Elbert Hubbard's name lives in literature, it will not be on account of his exquisite "Philistine" fooling; nor yet because of that interesting trifle, "A Message to Garcia." But it will be on account of this book, "The Man of Sorrows." Here is a limpid, lucid tale of a man's life as the author sees it—told as if it had never been told before—told without preaching; in language full of grace, tenderness, and strong, quiet reserve. The book is an unconscious bid for immortality.—Denver Post.

EDITOR BROWNE

Of The Rockford Morning Star.

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LITTLE JOURNEYS TO HOMES OF GREAT SCIENTISTS

Herschel



WRITTEN BY ELBERT HUBBARD AND DONE INTO BOOK FORM BY THE ROYCROFTERS AT THEIR SHOP, WHICH IS IN EAST AURORA, NEW YORK, A.D. MCMV



Herschel

THE great number of alterations of stars that we are certain have happened within the last two centuries, and the much greater number that we have reason to suspect to have taken place, are curious features in the history of the heavens, as curious as the slow wearing away of the landmarks of our earth on mountains, on river banks, on ocean shores. If we consider how little attention has formerly been paid to this subject, and that most of the observations we have are of a very late date, it would perhaps not appear extraordinary were we to admit the number of alterations, that have probably happened to different stars, within our own time, to be a hundred.

—WILLIAM HERSCHEL.

HERSCHEL

WILLIAM HERSCHEL, born in the city of Hanover, in 1738, was the fourth child in a family of ten. Big families, I am told, usually live in little houses, while little families live in big houses. The Herschels were no exception to the rule.

Isaac Herschel, known to the world as being the father of his son, was a poor man, depending for support upon his meagre salary as band-master to a regiment of the Hanoverian Guards. At the garrison school, taught by a retired captain, William easily was the star scholar. In mathematics he propounded problems that made the worthy captain pooh-pooh and change the subject.

At fourteen he was playing a hautboy in his father's band and practicing on the violin at spare times. For music he had a veritable passion, and to have a passion for a thing means that you excel in it—excellence is a matter of intensity.

¶ One of the players in the band was a Frenchman, and William made an arrangement to give the "parle vous" lessons on the violin as payment for lessons in French.

This whole brood of Herschel children

was musical, and very early the young Herschels became self-supporting as singers or players. "It is the only thing they can do," their father said. But his loins were wiser than his head.

In 1755 William accompanied his father's band to England, where they went to take part in a demonstration in honor of a Hanoverian, one George III., who later was to play a necessary part in a symphony that was to edify the American Colonies. America owes much to George III.

Young Herschel had already learned to speak English, just as he had learned French. In England he spent all the money he had for three volumes of "Locke on the Human Understanding." These books were to remain his lifelong possession and to be passed on, well-thumbed, to his son over half a century later.

William Herschel was nineteen on the breaking out of the Seven Years' War. His regiment had been ordered to march in a week. Here was a pivotal point —should he go and fight for the glory of Prussia?

Not he—by the connivance of his mother and sisters, he was secreted on a trading sloop bound for England. ¶ This is what is called desertion; and just how the young man evaded the penalties, since the King of England was also Elector of Hanover, I do not know, but the House of Hanover made no effort toward punishment of the culprit, even when the facts were known. Perhaps musicians of quality were needed in England; and as sheep-stealing is looked upon lightly by priests who love mutton, so do kings forgive infrac-

tions if they need the man. ¶ When William Herschel landed at Dover he had in his pocket a single crown piece, and his luggage consisted of the clothes he wore and a violin.

The violin secured him board and lodging along the road as he walked to London, just as Oliver Goldsmith paid his way with a similar legal tender.

In London Herschel's musical skill quickly got him an engagement at one of the theatres.

In a few months we hear of his playing solos at Brabandt's aristocratic concerts.

Little journeys were taken by the orchestra to which Herschel belonged in "the provinces." Among other places visited was Bath, and here the troupe was booked for a two-weeks' engagement.

At this time Bath was run wide open.

Bath was a rendezvous for the gouty dignitaries of Church and State who had grown swag through sloth and much travel by the gorge route.

There were ministers of state, soldiers, admirals-of-the-sea, promoters, preachers, philosophers, poets, players, polite gamblers and buffoons. They idled, fiddled, danced, gabbled, gadded and gossiped. The School for Scandal was written on the spot with models drawn from life. It wasn't a play—it was a cross-section of Bath society.

Bath was a clearing-house for the wit, learning and folly of all England—the combined Hot Springs, Coney Island, Saratoga and Old Point Comfort of the Kingdom. The most costly church of its size in America is

at St. Augustine, Florida. The repentant ones patronize it in Lent, the rest of the year it is closed.

At Bath there was the Octagon Chapel with the best pipe organ in England. Herschel played the organ—where he learned how nobody knew—he himself did not know. But playing musical instruments is a little like learning a new language. A man who speaks three languages can take a day off and learn a fourth almost any time. Somebody has said that there is really only one language, and most of us have only a dialect. Acquire three languages and you perceive that there is a universal basis upon which the various tongues are built.

Herschel could play the hautboy, the harpsichord and the violin. The organ came easy. When he played the organ in the Chapel at Bath, fair ladies forgot the Pump Room, and the gallants followed them—naturally. Herschel became the rage. He was a handsome fellow, with a pride so supreme that it completed the circle, and people called it humility. He talked but little, and made himself scarce—a point every genius should ponder well. The disarming of the populace—confiscating canes, umbrellas and parasols—before allowing people to enter an art gallery is necessary; although it is a peculiar comment on humanity to think people have a tendency to smite, punch, prod and poke beautiful things. The same propensity manifests itself in wishing to fumble a genius. Get your coarse hands on Richard Mansfield if you can! Corral Maude Adams—hardly. To do big things, to create—breaks

down tissue awfully, and to mix it with society and still do big things for society is impossible.

At Bath, Herschel was never seen in the Pump Room, nor on the North Parade. People who saw him, paid for the privilege. "In England about this time look out for a shower of genius," the almanackers might have said.

To Bath came two Irishmen, Edmund Burke and Richard Brinsley Sheridan. Burke rented rooms of the worthy Doctor Nugent, and married the doctor's daughter, and never regretted it.

Sheridan also married a Bath girl, but added the right touch of romance by keeping the matter secret, with the intent that if either party wished to back out of the agreement it would be allowed. This was quite Irish-like, since according to English Law a marriage is a marriage until Limbus congeals and is used for a skating rink.

With the true spirit of chivalry, Richard Brinsley Sheridan left the questions of publicity or secrecy to his wife—she could have her freedom if she wished. He was a fledgeling barrister, with his future in front of him, the child of "strolling players"; she, the beautiful Miss Linlay, was a singer of note. Her father was leader of the Bath Orchestra, and had a School of Oratory where young people agitated the atmosphere in orotund and tremolo and made the ether vibrate in glee. Dr. Linlay's daughter ,was his finest pupil, and with her all of his theories concerning the Sixteen Perspective Laws of Art were elucidated.

She also proved a few points in stirpiculture. She was a most beautiful girl of seventeen when Sheridan led her to the altar, or I should say to a Dissenting Parson's back door by night. She could sing, recite, act, and impersonate in pantomime and Greek gown, the passions of Fear, Hate, Supplication, Horror, Revenge, Jealousy, Rage and Faith.

Romney moved down to Bath just so as to have Miss Linlay and Lady Hamilton for models. He posed Miss Linlay as the Madonna, Beulah, Rena, Ruth, Miriam and Cecilia; and Lady Hamilton for Susannah at the Bath, Alicia and Andromache, and also had her illustrate the Virtues, Graces, Fates, and Passions.

When the beautiful Miss Linlay, the pride and pet of Bath, got ready to announce her marriage, she did it by simply changing the inscription beneath a Romney portrait that hung in the ante-room of the artist's studio, marking out the words "Miss Linlay," and writing over it "Mrs. Richard Brinsley Sheridan."

¶ The Bath porchers who looked after other people's business, having none of their own, burbled and chortled like siphons of soda, and the marvel to all was that such a brilliant girl should thus throw herself away on a sprig of the law. "He acts, too, I believe," said Goldsmith to Dr. Johnson. And Dr. Johnson said, "Sir, he does nothing else," thus anticipating James McNeill Whistler by over a hundred years.

But alas for the luckless Linlay, the Delsarte of his day, poor man! he used words not to be found in Johnson's Dictionary, and outdid Cassius in the quarrel scene

to the Brutus of Richard Brinsley. ¶ But soon things settled down—they always do when mixed with time—and all were happy, or reasonably so, forever after. ¶ Herschel resigned from Brabandt's Orchestra and remained in Bath. He taught music, played the organ, became first violinist for Professor Linlay and later led the orchestra when Linlay was on the road starring the one-night stands and his beautiful daughter.

Things seemed to prosper with the kindly and talented German. He was reserved, intellectual, and was respected by the best. He was making money—not as London brokers might count money, but prosperous for a music teacher.

And so there came a day when he bought out the school of Professor Linlay, and became proprietor and leader of the famous Bath Orchestra.

But the talented Mrs. Brinsley Linlay Sheridan was sorely missed—a woman soloist of worth was needed. ¶ Herschel thought and pondered. He tried candidates from London and a few from Paris. Some had voices, but no intellect. A very few had intellect, but were without voice. Some thought they had a voice when what they had was a disease. Other voices he tried and found guilty. Those who had voice and spirit had tempers like a tornado.

Herschel decided to educate a soloist and assistant. To marry a woman for the sake of educating her was risky business—he knew of men who had tried it—for men have tried it since the time of the Cave-Men. ¶ A bright thought came to him! He would go back to

Deutschland and get one of his sisters, and bring her over to England to help him in his work.

IT was a most fortunate stroke for Herschel when he went back home to get one of his sisters to come over into Macedonia and help him. No man ever did a great work unless backed up by a good woman. There were five of these Herschel girls—three were married, so they were out of the question, and one was engaged. This left Caroline as first, last and only choice. Caroline was twenty-two, and could sing a little. She had appeared in concerts for her father when a child. But when the father died the girl was set to work in a millinery and dressmaking shop, to help support the big family. The mother didn't believe that women should be educated—it unfitted them for domesticity, and to speak of a woman as educated was to suggest that she was a poor housekeeper. In Greece of old, educated women were spoken of as "companions"—and this meant that they were not what you call respectable. They were the intellectual companions of men. The Greek term of disrespect carried with it a trifle of a suggestion not intended; i. e., that women who were not educated—not intellectual—were really not companionable—but let that pass.

It is curious how this idea that a woman is only a scullion and a drudge has permeated society until

even the women themselves partake of the prejudice against themselves.

Mother Herschel didn't want her daughters to become educated, nor study the science of music nor the science of anything. A goodly grocer of the Dutch School had been picked out as a husband for Caroline, and now if she went away her prospects were ruined—ach, mein Gott! or words to that effect. And it was only on William's promise to pay the mother a weekly sum equal to the wages that Caroline received in the dressmaking shop that she gave consent to her daughter's going.

Caroline arrived in England wearing wooden shoon and hoops that were exceeding Dutch, but without a word of English. In order to be of positive use to her brother, she must acquire English and be able to sing, not only sing well, but remarkably well.

In less than a year she was singing solo parts at her brother's concerts to the great delight of the aristocrats of Bath. They heard her sing, but they did not take her captive and submerge her in their fashionable follies as they would have liked to do.

The sister and brother kept close to their own rooms. Caroline was the housekeeper, and took a pride in being able to dispense with all outside help. She was small in figure, petite, face plain but full of animation.

¶All of her spare time she devoted to her music. After the concerts she and her brother would leave the theatre, change their clothes and then walk off into the country, getting back at one or two o'clock in the

morning. On these midnight walks they used to study the stars and talk of the wonderful work of Kepler and Copernicus. There were various requests that Caroline should go to London and sing, but she steadfastly refused to appear on a stage excepting where her brother led the orchestra.

About this time Caroline wrote a letter home, which missive, by the way, is still in existence, wherein she says: "William goes to bed early when there are no concerts or rehearsals. He has a bowl of milk on the stand beside him, and he reads Smith's 'Harmonics' and Ferguson's 'Astronomy.' I sit sewing in the next room and occasionally he will call to me to listen while he reads some passage that most pleases him. So he goes to sleep buried beneath his favorite authors, and his first thought in the morning is how to obtain instruments so we can study the harmonics of the sky."

And a way was to open—they were to make their own telescope—what larks! Brother and sister set to work studying the law of optics. In a second-hand store they found a small Gregorian reflector with an aperture of about two inches.

This gave them a little peep into the heavens, but was really only a tantalization. They set to work making a telescope tube out of pasteboard. It was eighteen feet long, and the "board" was made in the genuine pasteboard way—by pasting sheet after sheet of paper together until the substance was as thick and solid as a board.

So this brother and sister worked at all odd hours

pasting sheet after sheet of paper—old letters, old books—with occasional strips of cloth laid in to give extra strength. The tube was eighteen feet long. Lenses were procured in London and at last our precious musical pair, with astronomy for their fad, had the satisfaction of getting a view of Saturn that showed the rings.

It need not be explained that astronomical observations must be made out-of-doors. Further, the whole telescope must be out-of-doors so to get an even temperature. This is a fact that the excellent astronomers of the Mikado of Japan did not know until very recently. It seems they constructed a costly telescope and housed it in a costly observatory house, with an aperture barely large enough for the big telescope to be pointed out at the heavens. Inside, the astronomer had a comfortable fire, for the season was winter and the weather cold. But the wise man could see nothing and the belief was getting abroad that the machine was bewitched, or that their Yankee brothers had lawsonized the buyers, when our own David P. Todd, of Amherst, happened along and informed them that the heat waves which arose from their warm room caused a perturbation in the atmosphere which made star-gazing impossible. At once they made their house over, with openings so as to insure an even temperature and Prince Fusiyama Noguchi wrote to Professor Todd, making him a Knight of the Golden Dragon on special order of the heaven-born Mikado.

The Herschels knew enough of the laws of heat and

refraction to realize that they must have an even temperature, but they forgot that pasteboard was porous. So one night they left their telescope out-of-doors, and a sudden shower transformed the straight tube into the arc of a circle.

All attempts to straighten it were vain, so they took out the lenses and went to work making a tube of copper. In this, brother, sister and genius—which is concentration and perseverance—united to overcome the innate meanness of animate and inanimate things. A failure was not a failure to them—it was an opportunity to meet a difficulty and overcome it.

The partial success of the new telescope aroused the brother and sister to fresh exertions. The work had been begun as a mere recreation—a rest from the exactions of the public which they diverted and amused with their warblings, concussions and vibrations.

They were still amateur astronomers and the thought that they would ever be anything else had not come to them. But they wanted a better view of the heavens —a view through a Newtonian reflecting telescope. So they counted up their savings and decided that if they could get some instrument maker in London to make them a reflecting telescope six feet long, they would be willing to pay him fifty pounds for it.

This study of the skies was their only form of dissipation, and even if it was a little expensive it enabled them to escape the Pump-Room rabble and flee boredom and introspection.

A hunt was taken through London, but no one could

A Little Journey to the Home of Elbert Hubbard

By TERENCE V. POWDERLY

THE conductor shouted: "All out for East Aurora!".

And he told the truth, for everybody got out and the train went off in a lonesome, regretful kind of a way. The conductor and train-hands wished they could stop off, too, but they were on the run and could n't.

I looked around for some one to tell me where to find Elbert Hubbard, and a young man dressed in a little brief authority and a suit of overalls, wearing a Roycroft badge and a welcoming grin asked, "Going to Roycroft?" I said "Yes," and he separated me from my satchel and umbrella, gave me a hearty hand-shake and told me to walk straight ahead and I could n't miss it.

Were you ever in East Aurora? No, then you 've missed a lot. It is not a paradise, but would make a first-class vestibule for one. Trees, old trees with rugged trunks and wide-spreading limbs, line the walks, and every tree nods and whispers a thousand welcomes from among the leaves that hide the sun of an August day from view.

¶ The walk from the station to the Phalansterie may be a mile, a half-mile, or a quarter of a mile, more or less, but you don't notice the length of it while eagerly pushing forward to see the place where the most wonderful of books and the quaintest of furniture are made. You meet men, women and children as you walk along, you don't know them from Adam, but they all say a kind word, or smile approvingly as you pass.

When I was a child I knew an old German woman who lived down where the woods had been cleared away to

make room for houses. She was our next door neighbor and boylike, I could be found at her house when I should have been at home. She grew flowers all round the house. They crept up the porch and sent their perfume thru the door with you as you entered. They peeped in the windows and climbed the fence to meet and welcome you, johnny-jump-ups, four-o'clocks, dahlias, fox-gloves, harebells, phlox, larkspurs, scores of others and nasturtiums. The nasturtiums she grew were tinted with all the hues of a glorious sunset, and thru the long years that stretch between that far-away time and now, I can see the silvery leaves and catch the odor of the blossoms.

I asked no one where the Roycroft Shops were, and when I came upon them did not see them for a long time. A low, well-built stone wall runs around Roycroftie, and along that wall, over it, caressing it, shielding and communing with it were the brilliant-hued, never-forgotten companions of the days when cut-down breeches, ravelled stitches and misplaced switches (as I then regarded them) were new to me. Extending a welcome in red and yellow, green and gold, the nasturtiums pointed the way to the "Chapel" where I saw other pilgrims standing, chatting and listening.

When a church or chapel comes to view one instinctively sobers down into a feeling of reverential calm. I do anyway, and the Roycroft Chapel, beautiful in its homelike exterior and grand in its simplicity, acknowledged the introduction of the nasturtiums as I entered. Erected by willing, well-trained hands and dedicated to the service of God thru helping Man, the Chapel is not unlike others I have seen. It is, however, open to all. Turk, Jew and Atheist may touch elbows with the Catholic, Presbyterian and Methodist without feeling that any of the powder of piety has been rubbed off. God does His best work thru the best of all His instruments, and

in this Chapel the work of man cheers the eye, pleases the senses and makes one feel that he is in the house of God, because the place is dedicated to His children. Made by man, for man and open to mankind "of all descriptions" you feel at home the moment you enter it. Pictures around the walls, roomy seats that do not give you a taste of the "sweet ultimately" by cramping your knees up against your chin, pleasant-faced people who laugh and talk out loud, you find in this Chapel. You find just such people in other chapels but somehow or other they do not laugh there. You will see and hear men and women weep in church, speak no word above a whisper there, and yet people do not go there for trouble, they do not go there to whisper or cry, to seek sorrow or grief. They go there to be real, to find rest, peace and happiness, but do not give audible expression to their happiness in a laugh.

Man made the church, God made man and the trees; in church man may not laugh aloud but under the grand, wonderful trees which God spreads above us we may laugh, sing and do what we will so long as it is not offensive to God or our neighbor. But bless me! I am moralizing, and that won't do.

Leaving the Chapel I sought Hubbard and found him standing beneath the bell that summons the faithful to lectures and concerts. He was dressed in a suit of overalls and looked the sympathetic, soulful man he is. He said: "Hello, Terence, glad you came."

I remarked: "Glad to find you dressed up for company," and then he said, "I will have you in a suit like this before you are here very long."

That was the meeting and the greeting.

After a lecture on what to eat and how to eat, I went to eat—at the Phalansterie. Young women who did artistic work in the Roycroft Shop week-days and sang in the Chapel on Sundays waited on the table every day. Ev-

erybody knew every one else tho they had never met before. You just took your seat where your fancy or the waitress suggested, and began a course of physical culture among the well-filled dishes. Turn to the left or right and begin a talk on politics, religion, socialism, finance, forestry, botany, bugology or burglary, and your neighbor knew how to answer you. No frills, no restraint.

¶ I was there several days—the time was all too short. There was no starch, no fuss and feathers, no ostentation, no pomp or ceremony. That conference acted like one great family coming home from many parts to attend a reunion. Surely there must be something in the Philistine habit, once acquired, that brings strangers into close touch as friends without the formality of an introduction.

¶ There were Philistines there from everywhere, and royal good fellows they were. Many of the Roycrofters are women, and they were well and handsomely represented at that conference.

East Aurora is not a drinking town, but it was full the day I got there, and Mr. Hubbard took me beneath his roof, as his guest during my stay. He just took me to my room, pushed open the door and said: "This is yours while you are here, you may come when you get ready, go when you please, do as you please, get up in time for breakfast at the Phalansterie—if you want to—no doors are locked here so you need not hurry home nights."

¶ I stayed there four or five days, and by the second day a feeling of honesty began to steal over me. I found myself leaving that room without even closing my satchel. Hubbard has not advertised for any of his personal property since I left, and that speaks well for me.

Marshall P. Wilder was there, too. He is the biggest little man in the country. Hubbard did n't know but that it might rain or be cloudy part of the time during the conference, and he brought Wilder there to take the place of the sunshine.

He is just a lump of concentrated sunshine. Wilder is not very tall lengthwise, but he is tall enough crosswise to make up for it and he is fun all the way 'round. You don't laugh at Wilder, you laugh with him. All his jokes are not new, either, but he hands out a new laugh with every one of them. You don't always get the best time out of the watch with the biggest case, but you can always count on having a good time with Marshall P. Wilder.

You ask what is Elbert Hubbard doing, is he in earnest, what does he propose to do? I don't know that I can answer you—on second thought I know I cannot. Hubbard is doing a noble work. He is making a community of artists of those who grow up in East Aurora and they are, thru their work, inspiring the rest of the world to do likewise. Those who do things in the Roycroft Shops put part of themselves into their product, and when the last finishing touch is imparted the worker sends out a blessing with his work and with it the wish that it may bring peace and happiness to "whomsoever these presents may come."

"Is he in earnest?" Look into that handsome, thoughtful face, read his eye and you will find nothing but earnestness there. He makes books that appear as heaven's messengers in this commonplace world of ours. Beauty, art, joy, gladness, satisfaction are all bound between the covers of Elbert Hubbard's books. Don't ask me to describe them, I cannot. Send for one, any one, read it, examine it, and you will realize that there is nothing quite like it anywhere. Its touch brings satisfaction, its language is simple but beautiful, and here let me remark that the simpler a man writes the less will he have to consult the dictionary.

Hubbard is not proposing to do anything, that I know of, he just goes ahead and does it, whatever it is. He is teaching men and women, boys and girls, to do things

instead of each other. He makes furniture as well as books, and when you see it you want to sit on it if it is a bench, or eat from it if it is a table. Everything made here speaks of home, not the studied, fixed-up home with bedizened chairs from which the gilt peels guiltily off, when you look at them, straight-backed sofas, tidies, throws and doilies scattered everywhere, ready to fasten themselves to your back and elope with you when you leave. No, but articles that are grand in their proportions, simple, solid, substantial and artistic. As with the books I will not try to describe them, get some of that furniture and it will tell its own story, I don't know how.

¶ "What does he propose?" I don't know. He does n't propose to turn the tide on which men float to ruin, but he does try to turn the strugglers and help them battle against the tide by causing them to do, and have respect for honest labor. He is reviving the lost art of illuminating books by hand, and is doing it well: he is inspiring a love of the beautiful and artistic as well as the useful. The last day I was there I saw men hand-tooling books making a hundred different marks and scrolls on the binding, doing it by hand, no two books alike. There is an individuality about the Roycroft books that you find nowhere else between covers, or on pages.

When I turned away from the workmen, and I did it reluctantly, a black spaniel stood at my heels and followed me down stairs. No one molested him: he walked around there as unreservedly as I did. Going down stairs we, the dog and I, met a little curly-haired girl going up. She had an armful of flowers. I asked her if she was bringing them in to her sister or her papa. She shook her curls, laughed and said: "No, just fetchin' 'em in for 'em all."

¶ If that child, while in the Shop, saw a box of paints, a brush and sheet of paper, she might test her ability and suit her fancy in painting a leaf for one of the books you get from the Roycrofters. If she did it well she would be

paid for it, but, well or badly, she would be invited to come again and try it over. No one feels a stranger or ill at ease in the Roycroft.

I watched Mr. Hubbard walk along the streets and saw the children meet him. They had a cheery word for him, they all smiled and talked to him. They all received a kind word from him and they were all happy, the children because they met him and he spoke to them; he, because they were happy.

Roycroft is no place for the artificial man, and, by the way, I rather guess that in this artificial age the man who acts naturally is regarded as insane. The chap with the clocked stockings that ticks loud enough to be heard upstairs in the garret, and pulls his trousers up to show them off, should pass on to Buffaló, and not stop off at East Aurora.

When you go there, take a second suit of clothes along. Roycroft is a stylish place, it has a style of its own, it is a fashionable place, it has a fashion of going out to the fields among the buttercups and daisies, out in the woods among the ferns, the shrubs and shades.

If you have a suit that will stand the wear and tear of out-door life, take it with you along with "your best suit of clothes," for you will wear it more than the other. You may wear what you like so long as it is respectable. No one pays attention to what you wear, but they do heed what you say, so study up and try to talk well before going there, or else cultivate that becoming silence which is a benediction to heal the blows of sound.

"What did I do?" Oh, I have been to so many places, have been written up—and down—so much that no one minds me now.

In the summer the habit grows on you, and all who visit Roycroft, get out early in the fields and woods. I met a singular character there named Freeland. He did n't stop at the Phalansterie or anywhere else that I know

of. I met him out in the woods one morning and was surprised to find him with an armful of stones, roots and specimens that he must have been hours gathering. Asked him if he came out before breakfast and he said: "No, just took a cup of coffee before coming out and after I got here, stubbed my toe and took a roll."

I met Wilson Fay there. You must meet him when you visit Roycroft. He knows more than any man I ever met about earth, trees, grasses, flowers, birds, beasts, (our kind excepted), rocks, stones and everything in nature. His knowledge is wonderful, his language is poetry itself, for it is the language of flowers. Think of—

A tree, a shrub, a radiant flower,
A crystal brook, a shaded bower,
A sunlit field, a golden day
And you know the soul of Wilson Fay.

He will pick up a weed, and from its leaves and roots read a poem to you. He says there are no noxious weeds, that a noxious weed is a plant we do not understand, and is not that true of men? The poor fellow going to the dogs thru drink—no, not to the dogs, for they do not drink—who is shunned and reviled, called a bad weed, may be only a plant we do not understand, and a little kindness, a word of cheer, a smile may change his whole career and make a posey of him.

Try it on the next one you meet and you will do more good than if you handed out a quarter or half-dollar to him. I don't mean to say that you should not hand out the half-dollar, too, if he needs it, but if you do, don't throw in a chunk of advice or a sermon—it won't do any good. But be kind. Kindness is like the measles, it is catching. I have it myself sometimes.

Mr. Hubbard doesn't keep his visitors in the Shop talking about himself, he talks less of himself than any man I know. He takes you out in the woods and talks plants and plant life, horses, animals of all kinds, and how to

labor satisfactorily and well. Animals are his friends, he knows all about them and loves them.

I heard men say after they were at Roycroft a day or two and had gone afield once or twice, that they could not understand why they had not taken interest in such things at home. Here they were eager to hear the lessons taught by Mr. Hubbard or Mr. Fay, and they took deep interest in shrub and flower. On going to East Aurora you go to a place where more people who love inanimate nature go than to most places. At home you do not meet such people, and you are richer for your visit. When at home, returning from your work, you may be in a brown study, or a blue or a green study, about a tree or flower, you wonder—

Is the flower pistillate or staminate,
Then, why did you stay so late?
Where 's that sugar, where 's that ham?
Until inside you think a dam,

the sugar and the ham take the place of tree and flower. Anyway there 's a time and place for everything, and at times the odor of ox-tail soup is apt to supplant ox-eye daisies in your affections.

At home, with its worries and toils and cares,
You 're apt to see the rents and tears.
But steal off to the woods for a quiet hour,
And you 'll hear God talk from tree and flower.
Learn the lesson and learn it well;
As you walk through field and shady dell,
Let it sink in deeply as it can,
That you cannot love flowers and not love man.
God made both, and He made them well;
He made the flowers, but man made hell.
There 'd be no hell if man could see
The beauty hidden in shrub and tree;
The flowers afield, the ferns in the wood
Are all so pure, so sweet, so good,
But God is wise, He knows best.
One day He 'll call man home to rest.
Man rules the earth, he 's monarch here;

But God rules here and everywhere.
The sceptre from man's hand will pass
And o'er him will rule the flowers and grass,

and so on. After all, the flowers and grass are man's best friends, they give him happiness in life, and cover him, with all his faults and virtues, after death.

But what about Hubbard, you ask. He radiates love of the beautiful, the artistic and the useful.

He is an inspiration.

He asks no one to do what he is not willing to do himself; and he will do whatever comes to his hand to do. Honest work, done with all your heart and soul, is what you should do—and that is the way he works. No one thinks of the clock in the Roycroft Shop. I should think that the man who stole an hour, or minute of time there would feel his own pocket after awhile and wonder who had picked it.

Once a year, you may go oftener if you wish, Elbert invites to East Aurora a number of Philistines, some of whom, like myself, have been slain many times over with the jaw-bone of Balaam's teacher of languages. This gathering is called the Roycroft Conference. Men and women who think for themselves, but who respect the opinions of others, gather here.

You do not find the long-haired man or short-haired woman, but you find the manly man and womanly woman at the Conference each year. If you care to express your opinion no one takes offence so long as you do not run thru the realms of vulgarity, obscenity or profanity—these have no cards of admission to the Roycroft Conference.

There are lectures at the Chapel and out at the pavilion in the woods, visits to the barn where Ali Baba milks the cows and speaks a wonderful language that all, including the cows, may understand, walks afield and out to the woods where—

To him who in the love of nature holds
Communion with her visible forms, she speaks
A various language,

and makes one feel better for having mingled with the Royal Roycrofters who believe the good things of this earth were made for its men and women, made to be enjoyed here and not hereafter, made to be enjoyed by all, shared by all, for joy and happiness may be given to others and in the doing of it we make ourselves happier. You are not asked to give up any of your earthly possessions, but in giving and taking kindness, considerate treatment, happiness and good-cheer, all are communists. An inspiring genius must have given birth to all this, and his name is Elbert Hubbard during his visit to this earth.

The world has produced many great men—it has never produced a faultless man. Hubbard's faults, and I hope he is not without them, are his own. I did not enquire into or meddle myself with them and I felt greatly relieved when he did not enquire into mine, for I am not made of the kind of clay that can throw stones accurately. I know more about myself than I know about Hubbard, or any one else, and, while I have heard and read many bad things about myself, I do not believe them all. Anyway the worst of them is not so bad as I could tell about myself if I became real chummy with the public. Therefore am I pleased that no one knows me as I know myself, and if any of my friends are blessed with faults and some other friend wishes to gossip about them, I am not the one to "cast the first stone" or the last one either.

The world will write Elbert Hubbard a benefactor of the race. He seeks to cause workers to put in practice the old advice: "Whatever your hand finds to do, do it well." He detests cant, hates hypocrisy, and despises sham. He is a real man in all that he does. His writings are virile,

arrow-tipped and strong bowed. His blow has the effect of a sledge, but he uses only a quill. His vocabulary is wonderful, his *Little Journeys* are classics.

Every fellow who thought he knew how to write before he read Elbert Hubbard, is barking at him, calling him fake, upstart, insane, insincere, and a lot of other names that he has to consult the dictionary to learn how to spell—and then he tries to imitate him.

When the mental hydrophobia that now animates them has been buried with them, Hubbard will be remembered as one who served his fellowmen without asking leave, helped them in his own way to lift themselves out of the rut, that was beaten for them by others, and to walk in a new road.

He is teaching man to do his work well, to respect the labor of his own hands, to be kind, to be cheerful in his work, to aspire to the highest ideals; he is teaching man to be proud of his work and to throw his false pride to the dogs.

Hubbard does not ask you to agree with his religious or political views, or with any of his views for that matter, but he claims for all men the right to do as he does—express their views without fear or favor, and be true to themselves. Hubbard keeps his hands in his own pockets; some of his critics prefer exploring their neighbors' pockets. He makes many a vigorous plea for freedom, but no man knows better than Elbert Hubbard that freedom implies responsibility. In his private life Hubbard is a regular Puritan. He is not afraid of work, for the last time I saw him he was walking slowly, but fearlessly toward the wood-pile, where a sawbuck stood exposed to view.

If this Little Journey to the Home of Elbert Hubbard is not satisfactory to you, why go to East Aurora yourself.

be found who would make such an instrument as they wanted for the price they could afford to pay. They, however, found an amateur lens polisher who offered to sell his tools, materials and instruments for a small sum. After consultation the brother and sister bought him out. So at the price they expected to pay for a telescope they had on their hands a machine shop.

¶ The work of grinding and polishing lenses is a most delicate business. Only a person of infinite patience and persistency can succeed at it. In Alleghany, Pennsylvania, lives John Brashear, who, by his own efforts, assisted by a noble wife, graduated from a rolling mill and became a maker of telescopes. Brashear is practically the one telescope lens-maker of America since Alvan Clark resigned. There is no competition in this line—the difficulties are too appalling for the average man. The slightest accident or an unseen flaw, and the work of months or years goes into the dust-bin of time, and all must be gone over again.

So when we think of this brother and sister sailing away upon an unknown ocean—working day after day, night after night, week after week and month after month, discarding scores of specula which they had worked upon many weary hours in order to get the glass that would serve—we must remove our hats in reverence.





OD sends great men in groups. From about 1740 for the next thirty-five years the intellectual sky seemed full of shooting stars. Watt had watched his mother's teakettle to a purpose; Boston Harbor was transformed into another kind of Hyson dish; Franklin had been busy with kite and key; Gibbon was writing his "Decline and Fall"; fate was pitting the Pitts against Fox; Hume was challenging the worshippers of a fetich and supplying arguments still bright with use; Voltaire and Rousseau were preparing the way for Madame Guillotine; Horace Walpole was printing marvelous books at his private press at Strawberry Hill; Sheridan was writing autobiographical comedies; Garrick was mimicking his way to immortality; Gainsborough was working the apotheosis of a hat; Reynolds, Lawrence, Romney, and West the American, were forming an English School of Art; George Washington and George III. were linking their names preparatory to sending them down the ages; Boswell was penning undying gossip; Blackstone was writing his "Commentaries" for legal lights unborn; Thomas Paine was getting his name on the blacklist of orthodoxy; Burke the Irishman, was polishing his brogue so that he might be known as England's greatest orator; the little Corsican was dreaming dreams of conquest; Arthur Wellesley was having presentiments of coming difficulties; Goldsmith was giving dinners with bailiffs for servants; Warren Hastings was defending a suit where the

chief participants were to die before a verdict was rendered; Captain Cook was giving to this world new lands, while William Herschel and his sister were showing the world still other worlds, till then unknown.

THE brother and sister had thought they would be content when they had followed the subject of astronomy as far as Ferguson had followed it, and knew all that he knew. Progress depends upon being continually dissatisfied. Ferguson now only aggravated them by his limitations.

In their music they amused, animated and inspired the fashionable idlers. William gave lessons to private pupils, led his orchestra, played the organ and harpsichord and managed to make ends meet, and would have gotten reasonably rich had he not invested his spare cash in lenses, brass tubes, eye-pieces, specula and other such trifles, and stood most of the night out on the lawn peering at the sky.

He had been studying stars for seven years before the Bath that he amused awoke to the fact that there was a genius among them. And this genius was not the idolized Beau Nash whose statue adorned the Pump Room! No, it was the man whose back they saw at the concerts.

During all these years Herschel had worked alone and had scarcely ever mentioned the subject of astron-

omy with any one save his sister. One night, however, he had moved his telescope into the middle of the street to get away from the shadows of the houses. A doctor who had been out to answer a midnight call stopped at the unusual sight and asked if he might look through the instrument. Permission was courteously granted.

The next day the doctor called on the astronomer to thank him for the privilege of looking through a better telescope than his own. This doctor was Sir William Watson, an amateur astronomer and all-'round scientist, and a member of the Royal Society of London.

¶ Herschel had held himself high—he had not gossiped of his work with the populace, cheapening his thought by diluting it for cheap people. Watson saw that Herschel, working alone, isolated, had surpassed the schools. There is a nugget of wisdom in Ibsen's remark, "The strongest man is he who stands alone," and Kipling's paraphrase, "He travels the fastest who travels alone."

The chance acquaintance of Herschel and Watson soon ripened into a very warm friendship. Herschel amused the neurotics, Watson dosed and blistered them—both for a consideration. Each had a beautiful contempt for the society they served. Watson's father was of the purple, while Herschel's was of the people, but both men belonged to the aristocracy of intellect.

¶ Watson introduced Herschel into the select scientific circle of London, where his fine reserve and dignity made their due impress. Herschel's first paper to

the Royal Society, presented by Dr. Watson, was on the periodical star in Collo Ceti.

The members of the Society, always very jealous and suspicious of outsiders, saw they had a thinker to deal with ☙ ☙

Some one carried the news to Bath—a great astronomer was among them! About this time Horace Walpole said, "Mr. Herschel will content me if instead of a million worlds, he can discover me thirteen colonies well inhabited by men and women, and can annex them to the Crown of Great Britain in lieu of those it has lost beyond the Atlantic."

Bath society now took up astronomy as a fad, and fashionable ladies named the planets backward and forward from a blackboard list set up in the Pump House by Fanny Burney, the clever one. Herschel was invited to give popular lectures on the music of the spheres.

Herschel's music parlors were besieged by good people who wanted to make engagements with him to look through his telescope. One good woman gave the year, month, day, hour and minute of her birth and wanted her fortune told. Poor Herschel declined, saying he knew nothing of astronomy, but could give her lessons in music if desired.

In answer to the law of supply and demand, thus proving the efficacy of prayer, an itinerant astronomer came down from London and set up a five-foot telescope on the Parade and solicited the curious ones at tuppence a peep.

This itinerant interested the populace by telling them a few stories about the stars that were not recorded in Ferguson, and passed out his cards showing where he could be consulted as a fortune-teller during the day ✍ ✍

Once Herschel was passing by this street astronomer, who was crying his wares, and a sudden impulse coming over him to see how bad the man's lenses might be, he stopped to take a peep at Earth's satellite. He handed out the usual tuppence, but the owner of the telescope loftily passed it back saying, "I takes no fee from a fellow-philosopher!"

This story went the rounds, and when it reached London it had been amended thus: Charles Fox was taking a ramble at Bath, ran across William Herschel at work, and mistaking him for an itinerant, the great statesman stopped, peeped through the aperture, and then passing out a tuppence moved along blissfully unaware of his error, for Herschel being a perfect gentleman would not embarrass the great man by refusing his copper.

When Herschel was asked if the story were true he denied the whole fabric, which the knowing ones said was further proof of his gentlemanly instincts—for a true gentleman will always lie under two conditions—first to save a woman's honor, and second to save a friend from embarrassment.

As a profession, astrology has ever proved a better investment than astronomy. Astronomy has nothing to offer but abstract truth, and those who love astronomy

must do so for truth's sake. Astronomical discoveries cannot be covered by copyright or patent, nor can new worlds be claimed as private property and financed by stock companies, frenzied or otherwise. Astrology, on the other hand, relates to love-affairs, vital statistics, gold mines, misplaced jewels and lost opportunities. ¶ Even yet, in this year of grace, 1905, Boston newspapers carry a column devoted to announcements of astrologers, while the Cambridge Astronomical Observatory never gets so much as a mention from one year's end to the other. Besides that, astronomers have to be supported by endowment—mendicancy—while astrologers are paid for their prophecies by the people whose destinies they invent.

This shows us how far as a nation we have traveled on the stony road of Science. Science? Oh, yes, of course—science—bang! bang! bang!

IN March, 1791, Herschel found his place as a fixed star among the world's great astronomers by the discovery of Uranus. Years before this, William and Caroline had figured it out that there must be another planet in our system in order to account plausibly for the peculiar ellipses of the others. That is to say, they felt the influence of this seventh planet; its attractive force was realized, but where it was they could not tell. Its discovery by Herschel was quite accidental. He was sweeping the heavens

for comets when this star came within his vision. Others had seen it too, but had classified it as "a vagrant fixed star." It was the work of Herschel to discover that it was not a fixed star, but had a defined and distinct orbit that could be calculated. To look up at the heavens and pick out a star that could only be seen with a telescope—pick it out of millions and ascertain its movement seems like finding the proverbial needle in a haystack.

The present method of finding asteroids and comets by means of photography is simple and easy. The plate is exposed in a frame that moves by clock-work with the earth, so as to keep the same field of stars steady on the glass. After two, three or four hours exposure the photograph will show the fixed stars, but the planets, asteroids and comets will reveal themselves as a white streak of light, showing plainly where the sitters moved.

Herschel had to watch each particular star in person, whereas the photographic lens will watch a thousand.

¶ How close and persistent an observer a man must be, who, watching one star at a time, discovers the one in a million that moves, is apparent. Chance, surely, must also come to his aid and rescue if he succeeds.

¶ Herschel found his moving star, and at first mistook it for a comet. Later he and Caroline were agreed that it was indeed their long-looked-for planet. There are no proprietary rights in newly discovered worlds—the reward is in the honor of the discovery, just as the best recompense for a good deed lies in having done it.

¶ The Royal Society was the recording station, as Kiel, Greenwich and Harvard are now. Herschel made haste to get his new world on record through his kind neighbor, Dr. Watson.

The Royal Society gave out the information and soon vairous other telescopes corroborated the discovery made by the Bath musician.

Herschel christened his new discovery "Georgium Sidus" in honor of the King, but the star belonged as much to Germany and France as to England, and astronomers abroad scouted the idea of peppering the heavens with the names of nobodies. Several astronomers suggested the name "Herschel," if the discoverer would consent, but this he would not do. Dr. Bode then named the new star Uranus, and Uranus it is, although perhaps with any other name 'twould shine as bright.

Herschel was forty-three years old when he discovered Uranus. He was still a professional musician, and an amateur astronomer. But it did not require much urging on the part of Dr. Watson when he presented Herschel's name for membership in the Royal Society for that respectable body to at once pass favorably on the nomination. As one member in seconding the motion put it, "Herschel honors us in accepting this membership, quite as much as we do him in granting it." ❧ ❧

And so the next paper presented by Herschel to the Royal Society appears on the record signed "William Herschel, F. R. S." Later it was to appear, "William

Herschel, F. R. S., LL. D. (Edinburgh);" and then "Sir William Herschel, F. R. S., LL. D., D. C. L. (Oxon)."

IN 1782 George III. invited his distinguished Hanoverian countryman to become an attache of the Court with the title of "Astronomer to the King." The Astronomer-Royal, in charge of the Greenwich Observatory, was Dr. Maskelyne, a man of much learning, a stickler for the fact, with a mustard-seed imagination. Being asked his opinion of Herschel he assured the company thus, "Herschel is a great musician—a great musician!" Afterward Maskelyne explained that the reason Herschel saw more than other astronomers was because he had made himself a better telescope.

One real secret of Herschel's influence seems to have been his fine enthusiasm. He worked with such a vim, such animation, that he radiated light on every side. He set others to work, and his love for astronomy as a science created a demand for telescopes, which he himself had to supply. It does not seem that he cared especially for money—all he made he spent for new apparatus.

He had a force of a dozen men making telescopes. He worked with them in blouse and overalls, and not one among his workmen excelled him as a machinist. The King bought several of his telescopes for from

one hundred to three hundred pounds each, and presented them to universities and learned societies throughout the world. One fine telescope was presented to the University of Gottingen, and Herschel was sent in person to present it. He was received with the greatest honors, and scientists and musicians rivaled with each other to do him homage.

In 1782 Herschel and his sister gave up their musical work and moved from Bath to quarters provided for them near Windsor Castle. Herschel's salary was the modest sum of two hundred pounds a year. Caroline was honored with the title "Assistant to the King's Astronomer," with the stipend of fifty pounds a year. It will thus be seen that the kingly idea of astronomy had not traveled very far from what it was when every really respectable court had a retinue of singers, musicians, clowns, dancers, palmists and scientists to amuse the good people somewhat ironically called "nobility." King George III. paid his Cook, Master of the Kennels, Chaplain, and Astronomer the same amount. The father of Richard Brinsley Sheridan was "Elocutionist to the King," and was paid a like sum. When Dr. Watson heard that Herschel was about to leave Bath he wrote, "Never bought King honour so cheap."

It was nominated in the bond that Herschel should act as "Guide to the heavens for the diversification of visitors whenever his Majesty wills it." But it was also provided that the astronomer should be allowed to carry on the business of making and selling tele-

scopes. ¶ Herschel's enthusiasm for his beloved science never abated. But often his imagination outran his facts. Great minds divine the thing first—they see it with their inward eye. Yet there may be danger in this, for in one's anxiety to prove what he first only imagined, small proof suffices.

Thus Herschel was for many years sure that the moon had an atmosphere and was inhabited; he thought that he had seen clear through the Milky Way and discovered empty space beyond; he calculated distances, and announced how far Castor was from Pollux; he even made a guess as to how long it took for gaseous nebula to resolve itself into a planetary system; he believed the sun was a molten mass of fire—a thing many believed until they saw the incandescent electric lamp—and in various other ways made daring prophecies which science has not only failed to corroborate, but which we now know as errors.

But the intensity of his nature was both his virtue and his weakness. Men who do nothing and say nothing are never ridiculous. Those who hope much, believe much and love much, make mistakes. Constant effort and frequent mistakes are the stepping-stones of genius. ¶ In all, Herschel contributed sixty-seven important papers to the proceedings of the Royal Society, and in one of these written in his eightieth year he says, "My enthusiasm has occasionally led me astray, and I wish now to correct a statement I made to you twenty-eight years ago." He then enumerates some particular statement about the height of mountains in the moon,

and corrects it. Truth was more to Herschel than consistency. The earnestness, purity of purpose and simplicity of his mind, indeed, stamp him as one of the world's great men.

At Windsor he built a two-story observatory. In the winter time, every night when the stars could be seen, was sacred. No matter how cold the weather, he stood and watched, while down below, the faithful Caroline sat and recorded the observations that he called down to her.

Caroline was his confidante, adviser, secretary, servant, friend. She had a telescope of her own and when her brother did not need her services she swept the heavens on her own account for maverick comets. In her work she was eminently successful, and at least five comets are placed to her credit on the honor roll by right of priority. Her discoveries were duly forwarded by her brother to the Royal Society for record. ¶ Later, the King of Prussia was to honor her with a gold medal, and several learned societies elected her an honorary member.

When Herschel reached the discreet age of fifty he married the worthy Mrs. John Pitt, former wife of a London merchant. It is believed that the marriage was arranged by the King in person out of his great love for both parties. At least Miss Burney thought so. Miss Burney was Keeper of the Royal Wardrobe at the same salary that Herschel had been receiving—two hundred pounds a year. She also took charge of the Court Gossip, with various volunteer assistants.

"Gold, as well as stars, glitters for astronomers," said little Miss Burney. "Mrs. Pitt is very rich, meek, quiet, rather pretty and quite unobjectionable."

But poor Caroline! It nearly broke her heart. William was her idol—she lived but for him—now she seemed to be replaced. She moved away into a modest cottage of her own, resolved that she would not be an encumbrance to any one. She thought she was going into a decline, and would not live long anyway,—she was so pale and slight that Miss Burney said it took two of her to make a shadow.

But we get a glimpse of Caroline's energy when we find her writing home explaining how she had just painted her house, inside and out, with her own hands.

¶ Things are never so bad as they seem. It was not very long before William was sending for Caroline to come and help him out with his mathematical calculations.

Later, when a fine boy baby arrived in the Herschel solar system, Caroline forgave all and came to take care of what she called "the Herschel planetoid." She loved this baby as her own, and all of the pent-up motherhood in her nature went out to little "Sir John Herschel," the knighthood having been conferred on him by Caroline before he was a month old.

Mrs. Herschel was beautiful and amiable, and she and Caroline became genuine sisters in spirit. Each had her own work to do; they were not in competition save in their love for the baby.

As the boy grew, Caroline took upon herself the task

of teaching him astronomy, quite to the amusement of the father and mother.

Fanny Burney now comes in with a little flung-off nebulæ to the effect that "Herschel is quite the happiest man in the kingdom."

There is a most charming little biography of Caroline Herschel, written by the wife of Sir John Herschel, wherein some very gentle foibles are laid bare, and where at the same time tribute is paid to a great and beautiful spirit.

The idea that Caroline was not going to live long after the marriage of her brother, was "greatly exaggerated"—she lived to be ninety-eight, a century lacking two years! Her mind was bright to the last—when ninety she sang at a concert given for the benefit of an old ladies' home. At ninety-six she danced a minuet with the King of Prussia, and requested that worthy not to introduce her as "the woman astronomer, because, you know, I was only the assistant of my brother!"

William Herschel died in his eighty-fourth year, with his fame at full, honored, respected, beloved.

Sir John Herschel, his son, was worthy to be called the son of his father. He was an active worker in the field of science. A strong, yet gentle man, with no jealousy nor whim in his nature. "His life was full of the docility of a sage and the innocence of a child." He died at Collingwood, May 11, 1871, and his dust rests in Westminster Abbey close beside the grave of England's most famous scholar, Sir Isaac Newton.

HERE ENDETH THE LITTLE JOURNEY TO THE HOME OF HERSCHEL, AS WRITTEN BY ELBERT HUBBARD. THE BORDERS, INITIALS AND ORNAMENTS DESIGNED BY ROYCROFT ARTISTS, THE PRESSWORK BY LOUIS SCHELL, & THE WHOLE DONE INTO A BOOK BY THE ROYCROFTERS AT THEIR SHOP WHICH IS IN EAST AURORA, NEW YORK, IN MAY OF THE YEAR MCMV

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Hammers for Knockers without extra charge.

WRITE FOR CIRCULAR

THE ROYCROFTERS

East Aurora, which is in Erie County, N. Y.

THE highest faculty of mind is the constructive faculty—the faculty that builds.

A man who builds an industry must be a strong man. The man that builds is not to be feared. He is helping to organize the world for our benefit, and he is keeping our building faculties in practice. The trouble with the old and narrower culture was that it was receptive rather than constructive.

In the early days of our history, we produced men of a very broad culture—a culture that had the quality of constructiveness. Jefferson was such a man. Dr. Benjamin Franklin was such a man. Theirs was, like ours, a building era. ¶ Men, then, built government rather than industries. But there was a similarity of activity then and now, and a largeness of mind characterized both periods.

Later, there came a time when the dominant type of the cultivated man in the United States was a college professor, or a literary man or preacher. Along with them, and after them came the professional scholar, who despised practical life. He had slight knowledge of men. His judgment was not always sound. This we might call our pedantic era. A cultivated man of the pedantic era was not a building man. He acquired learning, and he did little else. Nor was he interesting, and it is hard to call an uninteresting man cultivated.

The third era is our own time of industrialism. We have the pedant yet; for a man may become a scholar, a specialist, by sheer industry. We make them by machinery, both in our own universities and abroad. But, when we have a cultivated man at all in our industrial era, he is more like the men of our first constructive epoch than he is like the pedant. Industry calls into action the constructive qualities, as statecraft called them into action a century or more ago.

The cultivated man, in a perfected, democratic industrial life, will be the most widely and sanely cultivated man that has been evolved.

His chief interest will be in the present; and the great forces of our industrial time will make him saner, broader, better and wiser.

—WALTER H. PAGE.



The lollypop, loblolby, lobscouse loafers who never put magazines back where they found them may have a slight excuse —often there is no regular place to keep the Good Stuff. This *Combination Pedestal and Magazine Rack* supplies a need in every house. Solid oak—very beautiful—weathered oak finish. Sent to the faithful for eight dollars.

THE ROYCROFTERS

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Roycroft Picture Frames

are made of plain, wide pieces of quartered oak, finished usually in Belgian or weathered oak. If your room or picture demands another shade, we can make it. ¶ The frames can be made any width for any size pictures, from one inch up to five, and specially carved if desired. Simply let us know the sizes of your pictures and we will do the rest.

THE ROYCROFTERS
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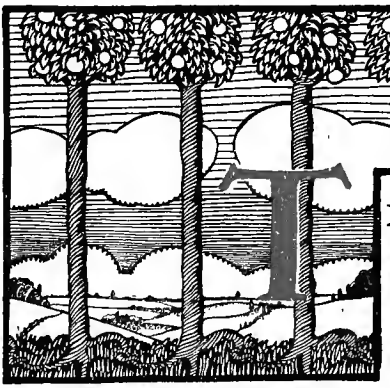
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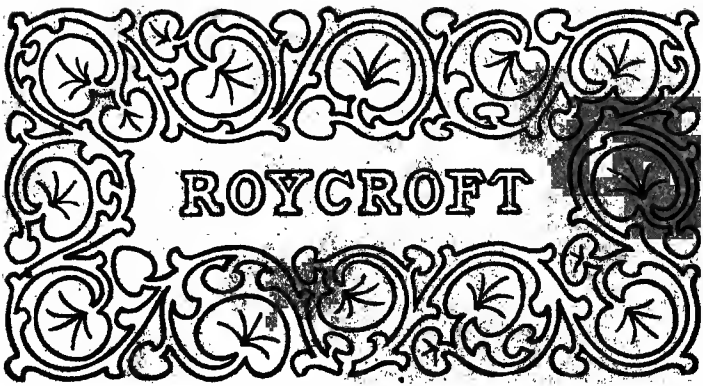
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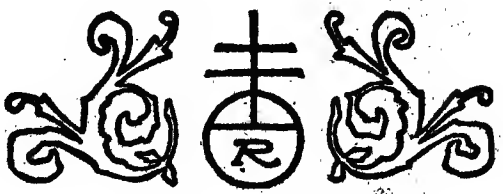
Vol. XVI JUNE, 1905 No. 6

Little Journeys

To Homes of Great Scientists

By ELBERT HUBBARD

DARWIN



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THE attention of the entire country is being attracted to the Railroad Gardening of the *Boston & Albany*. ¶ It has converted its principal suburban route, "The Circuit" thru Brookline, Riverside, Newtons and Wellesley, into beautiful public parks, and is reaching out to Worcester, Springfield, and Albany. The suburbanite along the *Boston & Albany* has a ride thru these parks every day, and not only the tourist and sightseer, but the landscape gardener, and other railroads are all studying the work of this road. ¶ The approaches to the depots are along graveled walks with stretches of green turf bordered with shrubbery. The depots have vines clambering over them, and every pond, crooked place, and rocky gulch instead of being an eyesore, was found to be only an opportunity for making the spot doubly beautiful. ¶ The peculiar feature of its gardening is that it is designed to be effective all the year round, even in winter. Many stubborn problems confronted the management, but they have all been solved, by the *Boston & Albany Railroad* in such a manner as to contribute an important chapter to the history of the art of landscape gardening.

NOTE—One writer has defined it as the "Garden Railroad"; another the "Railroad Beautiful." ¶ The Passenger Department has been issuing for general distribution a series of illustrated brochures by eminent writers, the latest being entitled "A Study in Railroad Gardening," by F. A. Arnold of *Suburban Life*, Boston, with illustrations by J. Horace McFarland, President American Civic Association, Harrisburg, Pa. Copies of this publication may be secured by addressing the Boston office.

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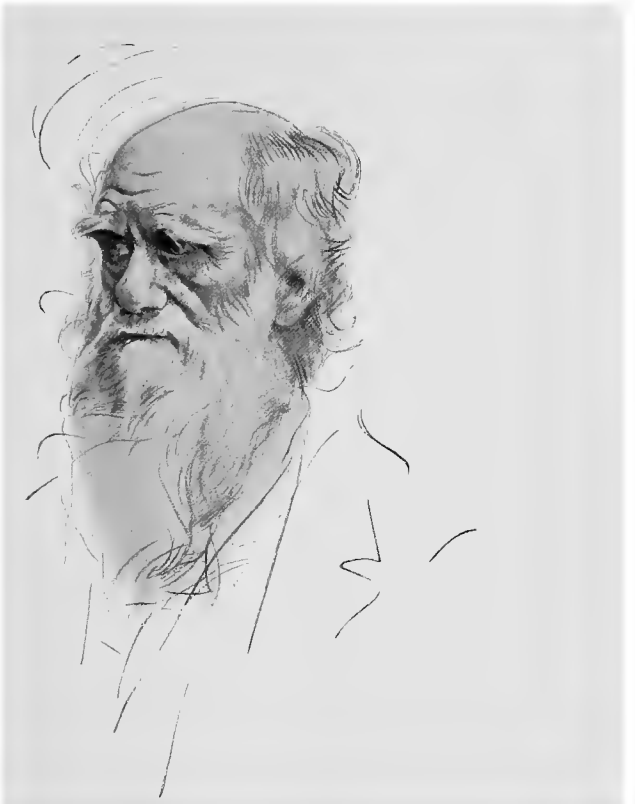
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LITTLE JOURNEYS TO HOMES OF GREAT SCIENTISTS

Darwin



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Darwin

CHARLES DARWIN

I FEEL most deeply that this whole question of creation is too profound for human intellect. A dog might as well speculate on the mind of Newton! Let each man hope and believe what he can.

CHARLES DARWIN to Asa Gray.

NONE have fought better, and none have been more fortunate than Charles Darwin. He found a great truth trodden underfoot, reviled by bigots, and ridiculed by all the world; he lived long enough to see it, chiefly by his own efforts, irrefragably established in science, inseparably incorporated into the common thoughts of men. What shall a man desire more than this?

THOMAS HUXLEY,
Address, April 27, 1882

CHARLES DARWIN

EVOLUTION is everywhere at work, even in the matter of jokes. Once in the House of Commons, Disraeli, who prided himself on his scholarship as well as his Hyperion curl, interrupted a speaker and sharply corrected him on a matter of history.

"I would rather be a gentleman than a scholar!" the man replied.

"My friend is seldom either," came the quick response.

When Thomas Brackett Reed was Speaker of the House of Representatives, a member once took exception to a ruling of the "Czar," and having in mind Reed's supposed presidential aspirations closed his protests with the thrust, "I would rather be right than president."

"The gentleman will never be either," came the instant retort.

But some years before the reign of the American Czar, Gladstone, Premier of England, said, "I would rather be right and believe in the Bible, than excite a body of curious, infidelic, so-called scientists to unbecoming wonder by tracing their ancestry to a troglodyte."

And Huxley replied, "I, too, would rather be right—I would rather be right than Premier."

Charles Darwin was a Gentle Man. He was the greatest naturalist of his time, and a more perfect gentleman never lived. His son Francis said, "I cannot remember of ever hearing my father utter an unkind or hasty word. If in his presence some one was being harshly criticised he always thought of something to say in way of palliation and excuse."

One of his companions on the "Beagle," who saw him daily for five years on that memorable trip wrote, "A protracted sea voyage is a most severe test of friendship, and Darwin was the only man on our ship, or that I ever heard of, who stood the ordeal. He never lost his temper or made an unkind remark."

Captain Fitz-Roy of the "Beagle" was a disciplinarian, and absolute in his authority, as a ship-captain must be.

The ship had just left one of the South American ports where the captain had gone ashore and been entertained by a coffee-planter. On this plantation all the work was done by slaves, who, no doubt, were very well treated. The Captain thought that negroes well cared for were very much better off than if free. And further, he related how the owner had called up various slaves and had the Captain ask them if they wished freedom, and the answer was always, "No."

Darwin here interposed by asking the Captain what he thought the answer of a slave was worth when being interrogated in the presence of his owner. Here

Fitz-Roy flew into a passion, berating the volunteer naturalist, and suggested a taste of the rope's end in lieu of logic.

Darwin made no reply, and seemingly did not hear the uncalled-for chidings.

In a few hours a sailor handed him a note from Captain Fitz-Roy full of abject apology for having so forgotten himself. Darwin was then but twenty-two years old, but the poise and patience of the young man won the respect, then the admiration and finally the affection of every man on board that ship. This attitude of kindness, patience and good will formed the strongest attribute of Darwin's nature, and to these godlike qualities he was heir from a royal line of ancestry. No man was ever more blest—more richly endowed by his parents with love and intellect—than Darwin. And no man ever repaid the debt of love more fully—all that he had received he gave again.

Darwin is the Saint of Science.

He proves the possible; and when mankind shall have evolved to a point where such men will be the rule, not the exception—as one in a million—then and not till then can we say we are a civilized people.

Charles Darwin was not only the greatest thinker of his time (with possibly one exception), but in his simplicity and earnestness, in his limpid love for truth —his perfect willingness to abandon his opinion if he were found to be wrong—in all these things he proved himself the greatest man of his time.

Yet it is absurd to try to separate the scientist from

the father, neighbor and friend. Darwin's love for truth as a scientist was what lifted him out of the fog of whim and prejudice and set him apart as a man. ¶ He had no time to hate. He had no time to indulge in foolish debates and struggle for rhetorical mastery —he had his work to do. That statesmen like Gladstone misquoted him, and churchmen like Wilberforce reviled him—these things were as naught to Darwin—his face was toward the sunrising. To be able to know the truth, and to state it, were vital issues—whether the truth was accepted by this man or that, was quite immaterial, excepting possibly to the man himself. In Darwin's nature there was no resentment.

Only love is immortal—hate is a negative condition. It is love that animates, beautifies, benefits, refines—creates. So firmly was this truth fixed in the heart of Charles Darwin, that throughout his long life the only things he feared and shunned were prejudice and hate. "They hinder and blind a man to truth," he said, "a scientist must only love."

EMERSON has been mentioned as the culminating flower of seven generations of New England culture. Charles Darwin seems a similar culminating product. Surely he showed rare judgment in the selection of his grandparents. His grandfather on his father's side was Dr. Erasmus Darwin, a poet, a naturalist, and a physician so discerning that

he once wrote, "The science of medicine will some time resolve itself into a science of prevention rather than a matter of cure. Man was made to be well, and the best medicine I know of is an active and intelligent interest in the world of nature." Erasmus Darwin had the felicity to have his biography written in German, and he has his place in the Encyclopedia Brittanica quite independent of that of his gifted grandson.

Charles Darwin's grandfather on his mother's side was Josiah Wedgwood, one of the most versatile men. He was as fine in spirit as those exquisite designs by Flaxman that you will see today on the Wedgwood pottery. Josiah Wedgwood was a business man—an organizer, and he was beyond this, an artist, a naturalist, a sociologist and a lover of his race. His portrait by Sir Joshua Reynolds reveals a man of rare intelligence, and his biography is as interesting as a novel by Kipling. His space in the Encyclopedia Brittanica is even more important than that occupied by his dear friend and neighbor, Dr. Erasmus Darwin. The hand of the Potter did not shake when Josiah Wedgwood was made. Josiah Wedgwood and Dr. Darwin had mutually promised their children to each other in marriage. Wedgwood became rich and he made numerous other men rich, and he enriched the heart and the intellect of England by setting before it beautiful things, and by living an earnest, active and beautiful life.

Josiah Wedgwood coined the word "queensware." He married his cousin Sarah Wedgwood. Their

daughter, Susannah Wedgwood, married Dr. Robert Darwin, and Charles Darwin, their son, married Emma Wedgwood, a daughter of Josiah Wedgwood the Second. Caroline Darwin, a sister of Charles Darwin, married Josiah Wedgwood the Third. Let those who have the time work out this origin of species in detail and show us the relationship of the Darwins and Wedgwoods. And I hope we 'll hear no more about the folly of cousins marrying, when Charles Darwin is before us as an example of natural selection.

From his mother Darwin inherited those traits of gentleness, insight, purity of purpose, patience and persistency that set him apart as a marked man.

The father of Charles Darwin, Dr. Robert Darwin, was a successful physician of Shrewsbury. His marriage to Susannah Wedgwood filled his heart, and also placed him on a firm financial footing, and he seemed to take his choice of patients. Dr. Darwin was a man devoted to his family, respected by his neighbors, and he lived long enough to see his son recognized, greatly to his surprise, as one of England's foremost scientists.

Charles Darwin in youth was rather slow in intellect, and in form and feature far from handsome. Physically he was never strong. In disposition he was gentle and most lovable. His mother died when he was eight years of age, and his three older sisters then mothered him. Between them all existed a tie of affection, very gentle, and very firm. The girls knew that Charles would become an eminent man—just how they could not guess—but he would be a leader of men—they felt

it in their hearts. It was all the beautiful dream that the mother has for her babe as she sings to the man-child a lullaby as the sun goes down.

In his autobiographical sketch, written when he was past sixty, Darwin mentions this faith and love of his sisters, and says, "Personally, I never had much ambition, but when at college I felt that I must work, if for no other reason, so as not to disappoint my sisters."

¶ At school Charles was considerable of a grubber, he worked hard because he felt that it was his duty. English boarding-schools have always taught things out of season, and very often have succeeded in making learning wholly repugnant. Perhaps that is the reason that nine men out of ten who go to college cease all study as soon as they stand on "the threshold," looking at life ere they seize it by the tail to snap its head off. To them education is one thing and life another.

¶ But with many headaches and many heartaches Charles got through Cambridge and then was sent to attend lectures at the University of Edinburgh. Of one lecturer in Scotland he says, "The good man was really more dull than his books, and how I escaped without all science being utterly distasteful to me I hardly know."

To Cambridge, Darwin owed nothing but the association with other minds, yet this was much, and almost justifies the college. "Send your sons to college and the boys will educate them," said Emerson.

The most beneficent influence for Darwin at Cambridge was the friendship between himself and Professor

Henslow. Darwin became known as "the man who walks with Henslow." Henslow taught botany, and took his classes on tramps afield and on barge rides down the river, giving out-of-door lectures on the way. This common-sense way of teaching appealed to Darwin greatly, and although he did not at Cambridge take botany as a study, yet when Henslow had an out-of-door class he usually managed to go along. In his autobiography Darwin gives great credit to this very gentle and simple soul, who, although not being great as a thinker, yet could animate and arouse a pleasurable interest. Henslow was once admonished by the faculty for his lack of discipline, and young Darwin came near getting himself into difficulty by declaring, "Professor Henslow teaches his pupils in love, the others think they know a better way!"

The hope of his father and sisters was that Charles Darwin would become a clergyman. For the army he had no taste whatsoever, and at twenty-one the only thing seemed to be the Church. Not that the young man was filled with religious zeal—far from that—but one must do something, you know. Up to this time he had studied in a desultory way, he had also dreamed and tramped the fields. He had done considerable grouse shooting and had developed a little too much skill in that particular line. To paraphrase Herbert Spencer, to shoot fairly well is a manly accomplishment, but to shoot too well is evidence of an ill-spent youth. Dr. Darwin was having fears that his son was going to be an idle sportsman, and he was urging the

divinity school. The real fact was that sportsmanship was already becoming distasteful to young Darwin, and his hunting expeditions were now largely carried on with a botanist's drum and a geologist's hammer.

¶ But to the practical Doctor these things were no better than the gun—it was idling, anyway. Natural History as a pastime was excellent, and sportsmanship for exercise and recreation had its place, but the business of life must not be neglected—Charles should get himself to a divinity school and quickly, too.

Things urged become repellant—and Charles was groping around for an excuse when a letter came from Professor Henslow saying, among other things, that the Government was about to send a ship around the world on a scientific surveying tour, especially to map the coast of Patagonia, & other parts of South America and Australia. A volunteer naturalist was wanted —board and passage free, but the volunteer was to supply his own clothes and instruments.

The proposition gave Charles a great thrill: he gave a gulp and a gasp and went in search of his father. The father saw nothing in the plan beyond the fact that the Government was going to get several years' work out of some foolish young man, for nothing—gadzooks!

Charles insisted—he wanted to go! He urged that on this trip he would be to but very little expense. "You say I have cost you much, but the fellow who can spend money on board ship must be very clever."

"But you are a very clever young man, they say," the father replied.

That night Charles again insisted on discussing the matter. The father was exasperated and exclaimed, "Go and find me one sane man who will endorse your wild-goose chase and I will give my consent."

Charles said no more—he would find that "sane man." But he knew perfectly well that if any average person endorsed the plan his father would declare the man was insane and the proof of it lay in the fact that he endorsed the wild-goose chase.

In the morning Charles started of his own accord to see Henslow. Henslow would endorse the trip, but both parties knew that Dr. Darwin would not accept a mere college professor as sane. Charles went home and tramped thirty miles across the country to the home of his uncle, Josiah Wedgwood the Second. There he knew he had an advocate for anything he might wish in the person of his fair cousin, Emma. These two laid their heads together, made a plan and stalked their prey.

They cornered Josiah the Second after dinner and showed him how it was the chance of a lifetime—this trip on H. M. S. the "Beagle!" Charles was n't adapted for a clergyman, anyway, he wanted to be a ship-captain, a traveler, a discoverer, a scientist, an author like Sir John Mandeville, or something else. Josiah the Second had but to speak the word and Dr. Darwin would be silenced, and the recommendation of so great a man as Josiah Wedgwood would secure the place.

Josiah the Second laughed—then he looked sober. He

agreed with the proposition—it was the chance of a lifetime. He would go back home with Charles and put the Doctor straight.

And he did.

And on the personal endorsement of Josiah Wedgwood and Professor Henslow, Charles Robert Darwin was duly booked as Volunteer Naturalist in Her Majesty's service.

CAPTAIN FITZ-ROY of the "Beagle" liked Charles Darwin until he began looking him over with a professional eye. Then he declared his nose was too large and not rightly shaped, besides, he was too tall for his weight—outside of these points the Volunteer would answer. On talking with young Darwin further, the Captain liked him better, and the imperfections were waived, although no promise was made that they would be remedied. In fact, Captain Fitz-Roy liked Charles so well that he invited him to share his own cabin and mess with him. The sailors seeing this, touched respectful forefingers to their caps and addressed the Volunteer as "Sir."

¶ The "Beagle" sailed on December 27th, 1831, and it was four years and ten months before Charles Darwin again saw England.

The trip decided the business of Darwin for the rest of his life, and thereby an epoch was worked in the upward and onward march of the race.

Captain Fitz-Roy of the British Navy was but twenty-three years old. He was a draftsman, a geographer, a mathematician and a navigator. He had sailed 'round the world as a plain tar, and taken his kicks and cuffs with good grace. At the Portsmouth Naval School he had won a gold medal for proficiency in study, and another medal had been given him for heroism in leaping from a sailing ship into the sea to save a drowning sailor.

Let us be fair—the tight little island has produced the men. To evolve a few good men she may have produced many millions of the spawn of earth—but let the fact stand: England has produced men.

Here was a beardless youth, slight in form, silent by habit, but so well thought of by his Government that he was given a ship, five officers, two surgeons and forty-one picked men to go around the world and make measurements of certain coral reefs and map the dangerous coasts of Patagonia and Tierra del Fuego.

The ship was provisioned for two years, but the orders were, "Do the work, no matter how long it may take, and your drafts on the Government will be honored."

Captain Fitz-Roy was a man of decision—he knew just where he wanted to go, and what there was to do. He was to measure and map dreary wastes of tossing tide, and do the task so accurately that it would never have to be done again—his maps were to remain forever a solace, a safety and a security to the men who go down to the sea in ships.

England has certainly produced the men—and Fitz-Roy

was one of them. ¶ But Fitz-Roy is now known to us, not for his maps which have passed into the mutual wealth of the world, but because he took on his trip, merely as an afterthought, a volunteer naturalist.

Before the "Beagle" sailed, Captain Fitz-Roy and young Mr. Darwin went down to Portsmouth, and the Captain showed him the ship. The Captain took pains to explain the worst. It was to be at least two years of close, unremitting toil. It was no pleasure excursion—there were no amusements provided, no cards, no wine on the table—the fare was to be simple in the extreme.

This way of putting the matter was most attractive to Darwin—Fitz-Roy became a hero in his eyes at once. The Captain's manner inspired confidence—he was a man who did not have to be amused or cajoled. "You will be left alone to do your work," said Fitz-Roy to Darwin, "and I must have the cabin to myself when I ask for it."

And that settled it.

Life aboard ship is like life in jail. It means freedom, freedom from interruption—you have your evenings to yourself, and the days as well.

Darwin admired every man on board the ship, and most of all, the man who selected them, and so wrote home to his sisters. He admired the men because each was intent on doing his work, and each one seemed to assume that his own particular work was the most important.

Second Officer Wickham was entrusted to see that the

ship was in good order, and so thorough was he that he once said to Darwin, who was constantly casting his net for specimens, "If I were the skipper I'd soon have you and your beastly belitterment out of this ship with all your devilish, damned mess."

And Darwin, much amused, wrote this down in his Journal, and added, "Wickham is a most capital fellow."

The discipline and system of ship life, the necessity of working in a small space, and of improving the calm weather, and seizing every moment when on shore, all tended to work in Darwin's nature exactly the habit that was needed to make him the greatest naturalist of his age.

Every sort of life that lived in the sea was new and wonderful to him. Very early on this trip Darwin began to work on the Cirripedia (barnacles) and we hear of Captain Fitz-Roy obligingly hailing homeward-bound ships, and putting out a small boat, rowing alongside, asking politely, to the great astonishment of the party hailed, "Would you oblige us with a few barnacles off the bottom of your good ship?" All this that the Volunteer, who was dubbed the "Flycatcher," might have something upon which to work.

When on shore a sailor was detailed by Captain Fitz-Roy to attend the "Flycatcher," with a bag to carry the specimens, geological, botanical and zoological, and a cabin boy was set apart to write notes. This boy who afterward became Governor of Queensland and a K. C. B. used in after years to boast a bit, and rightfully, of

his share in producing "The Origin of Species." When urged to smoke, Darwin replied, "I am not making any new necessities for myself."

When the weather was rough the "Flycatcher" was sick, much to Wickham's delight, but if the ship was becalmed, Darwin came out and gloried in the sunshine, and in his work of dissecting, labeling and writing memoranda and data. The sailors might curse the weather, he did not.

Thus passed the days.

At each stop many specimens were secured and these were to be sorted and sifted out at leisure.

On shore the Captain had his work to do, and it was only after a year that Darwin accidentally discovered that the sailor who was sent to carry his specimens, was always armed with knife & revolver, and his orders were not so much to carry what Wickham called, "the damn plunder," as to see that no harm befell the "Flycatcher."

Fitz-Roy's interest in the scientific work was only general—longitude, latitude, his twenty-four chronometers, his maps and constant soundings, with minute records kept his time occupied. For Darwin and his specimens, however, he had a constantly growing respect, and when the long five-years' trip was ended Darwin realized that the gruff and grim Captain was indeed his friend. Captain Fitz-Roy had trouble with everybody on board in turn, thus proving his impartiality, but when parting was nigh, tears came to his eyes as he embraced Darwin, and said, with prophetic

yet broken words, "The 'Beagle's' voyage may be remembered more through you than me—I hope it will be so!"

And Darwin, too moved for speech, said nothing excepting through the pressure of his hand.

THE idea of evolution took a firm hold upon the mind of Darwin, in an instant, one day on board the "Beagle." From that hour the thought of the mutability of species was the one controlling impulse of his life.

On his return from the trip 'round the world he found himself in possession of an immense mass of specimens and much data bearing directly upon the point that creation is still going on. That he could ever sort, sift and formulate his evidence on his own account, he never at this time imagined. Indeed, about all he thought he could do was to present his notes and specimens to some scientific society in the hope that some of its members would go ahead and use the material.

With this thought in mind he opened up correspondence with several of the universities and various professors of science, and found, to his dismay that no one was willing to even read his notes, much less house, prepare for preservation and index his thousands of specimens.

He read papers before different scientific societies,

however, from time to time, and gradually in London it dawned upon the few thinkers that this modest and low-voiced young man was doing a little thinking on his own account. One man to whom he had offered the specimens bluntly explained to Darwin that his specimens and ideas were only valuable to himself, and it was folly to try to give such things away. Ideas are like children and should be cared for by their parents, and specimens are for the collector. Seeing the depression of the young man, this friend offered to present the matter to the Secretary of the Exchequer. Everything can be done when the right man takes hold of it —the sum of one thousand pounds was appropriated by the Treasury for Charles Darwin's use in bringing out a Government report of the voyage of the "Beagle."

¶ And Darwin set to work, refreshed, rejoiced and encouraged.

He was living in London in modest quarters, solitary and alone. He was not handsome and he lacked the dash and flash that make a success in society. On a trip up to his old home, he walked across the country to see his uncle, Josiah Wedgwood the Second.

When he left it was arranged that he should return in a month and marry his cousin Emma Wedgwood.

¶ And it was all so done. One commentator said he married his cousin because he did n't know any other woman that would have him. But none were so unkind as to say that he married her in order to get rid of her, yet Henslow wondered how he ceased wooing science long enough to woo the lady. Doubtless the parents of

both parties had something to do with the arrangement, and in this instance it was beautiful and well. ¶ Darwin was married to his work, and no such fallacy as marrying a woman in order to educate her filled his mind. His wife was his mental mate, his devoted helper and friend.

It is no small matter for a wife to be the friend of her husband. Mrs. Darwin had no small oval aspirations of her own. She flew the futile Four-o'clock and made no flannel nightgowns for Fijis. Twenty years after his marriage, Darwin wrote thus: "It is probably as you say—I have done an enormous amount of work. And this was only possible through the devotion of my wife, who, ignoring every idea of pleasure and comfort for herself, arranged in a thousand ways to give me joy and rest, peace and most valuable inspiration and assistance. If I occasionally lost faith in myself she most certainly never did. Only two hours a day could I work, and these to her were sacred. She guarded me as a mother guards her babe, and I look back now and see how hopelessly undone I should have been without her."

In 1842, Darwin and his wife moved to the village of Down, County of Kent. The place where they lived was a rambling old stone house with ample garden. The country was rough & unbroken, and one might have imagined he was a thousand miles from London instead of only twenty. There were no aristocratic neighbors, no society to speak of. With the plain farmers and simple folk of the village Darwin was on good terms. He

became treasurer of the local improvement society, and thereby was serenaded once a year by a brass band. We hear of the village rector once saying, "Mr. Darwin knows botany better than anybody this side of Kew; and although I am sorry to say that he seldom goes to church, yet he is a good neighbor and almost a model citizen." Together the clergyman and his neighbor discussed the merits of climbing roses, sweet peas and morning-glories. Darwin met all and every one on terms of absolute equality, and never forced his scientific hypotheses upon any one. In fact, no one in the village imagined that this quiet country gentleman in the dusty gray clothes that matched his full iron-gray beard, was destined for a place in Westminster Abbey —no, not even himself!

Darwin's father, seeing that the Government had recognized him, and that the scientific societies of London were quite willing to do as much, settled on him an allowance that was ample for his simple wants.

¶ On the death of Dr. Darwin, Charles came into possession of an inheritance that brought him a yearly income of a little over five hundred pounds.

Children came to bless this happy household—seven in all. With these Darwin was comrade and teacher. Two hours a day were sacred for science, but outside of this time the children made the study their own and littered the place with their collections gathered on heath and dale. The recognition of the "holy time" was strong in the minds of the children, so no prohibitions were needed. One daughter has written in

familiar way of once wanting to go into her father's study for a forgotten pair of scissors. It was the "holy time," and she thought she could not wait, so she took off her shoes and entered in stocking-feet, hoping to be unobserved. Her father was working at his microscope —he saw her, reached out one arm as she passed, drew her to him and kissed her forehead. The guilty little girl never trespassed again—how could she, with the father that gave her only love!

That there was no sternness in this recognition of the value of the working hours is further indicated in that little Francis, aged six, once put his head in the door and offered the father a sixpence if he would come out and play in the garden.

For several years Darwin was village magistrate. Most of the cases brought before him were for poaching or drunkenness. "He always seemed to be trying to find an excuse for the prisoner, and usually succeeded," says his son. Once when a prosecuting attorney complained because Darwin had discharged a prisoner, the magistrate, who might have fined the impudent attorney for contempt of court, merely said, "Why, he's as good as we are. If tempted in the same way I am sure that I would have done as he has done. We can't blame a man for doing what he has to do!" ¶ This was poor reasoning from a legal point of view. Darwin afterward admitted that he didn't hear much of the evidence, as his mind was full of orchids, but the fellow looked sorry and he really couldn't punish anybody who had simply made a mistake.

The local legal lights gradually lost faith in Magistrate Darwin's peculiar brand of justice—he had n't much respect for law, and once when a lawyer cited him the criminal code, he said, "Tut, tut, that was made a hundred years ago!" Then he fined the man five shillings, and paid the fine himself, when he should have sent him to the workhouse for six months.

THE men who have benefited the world most, have, almost without exception, been looked down upon and depreciated by the priestly class. That is to say, the men upon whose tombs society now carves the word Savior, were outcasts and criminals in their day.

In a society where the priest is regarded as the mouthpiece of divinity—and therefore the highest type of man—the artist, the inventor, the discoverer, the genius—the man of truth—has always been regarded as a criminal. Society advances as it doubts the priest, distrusts his oracles, and loses faith in his institution.

In the priest, at first, was deposited all human knowledge, and what he did not know he pretended to know. He was the guardian of mind and morals, and the cure of souls. To question him was to die here and be damned for eternity.

The problem of civilization has been to get the truth past the preacher to the people—he has forever barred and blocked the way, and until he was shorn of his

temporal power there was no hope. The prisons were first made for those who doubted the priest; behind and beneath every episcopal residence were dungeons; the ferocious and delicate tortures that reached every physical and mental nerve were his. His anathemas and curses were always quickly turned upon the strong men of mountain or sea who dared live natural lives, said what they thought was truth, or did what they deemed was right.

Science is a search for truth, but theology is a clutch for power.

Nothing was so distasteful to a priest as freedom—a happy, exuberant, fearless, radiant and self-sufficient man he both feared and abhorred. A free soul was regarded by the Church as one to be dealt with. The priest has ever put a premium on pretense and hypocrisy. Nothing recommended a man more than humility and the acknowledgment that he was a worm of the dust. The ability to do and dare were in themselves considered proof of depravity. The education of the young has been monopolized by priests in order to perpetuate the fallacies of theology, and all endeavor to put education on a footing of usefulness and utility has been fought inch by inch.

Andrew D. White, in his book, "The Warfare of Science and Religion," has calmly and without heat sketched the war that Science has had to make to reach the light. Slowly, stubbornly, insolently theology has fought Truth step by step—but always retreating, taking refuge first behind one subterfuge, then

another. When an alleged fact was found to be a fallacy, we were told it was not a literal fact, simply a spiritual one. All of theology's weapons have been taken from her and placed in the Museum of Horrors —all save one, social ostracism. And this consists in a refusal to invite Science to indulge in cream-puffs. We smile, knowing that the man who now successfully defies theology is the only one she really, yet secretly admires. If he does not run after her, she holds true the poetic unities by running after him. Mankind is emancipated (or partially so).

Darwin's fame rests, for the most part, on two books, "The Origin of Species" and "The Descent of Man." Yet before these were published he had issued "A Journal of Research into Geology and Natural History," "The Zoology of the Voyage of the 'Beagle,'" "A Treatise on Coral Reefs," "Volcanic Islands," "Geological Observations," and "A Monograph of the Cirripedia." Had Darwin died before "The Origin of Species" was published he would have been famous among scientific men, although it was the abuse of theologians on the publication of "The Origin of Species" that really made him world famous. Alfred Russel Wallace, Darwin's chief competitor, said that "A Monograph on the Cirripedia" is enough upon which to found a deathless reputation.

Darwin was equally eminent in Geology, Botany and Zoology.

On November 24th, 1859, was published "The Origin of Species." Murray had hesitated about accepting the

work, but on the earnest solicitation of Sir Charles Lyell, who gave his personal guarantee to the publisher against loss, quite unknown to Darwin, twelve hundred copies of the book were printed.

The edition was sold in one day, and who was surprised most, the author or the publisher, it is difficult to say ✍ ✍

Up to this time theology had stood solidly on the biblical assertion that mankind had sprung from one man and one woman, and that in the beginning every species was fixed and immutable. Aristotle, three hundred years before Christ, had suggested that by cross-fertilization and change of environment, new species had been, and were being evoked. But the Church had declared Aristotle a heathen, and in every school and college of Christendom it was taught that the world and everything in it was created in six days of twenty-four hours each, and that this occurred four thousand and four years before Christ, on May Tenth.

¶ Those who doubted or disputed this statement had no standing in society, and in truth until the beginning of the Nineteenth Century, were in actual danger of death—heresy & treason being usually regarded as the same thing. Erasmus Darwin had taught that species were not immutable, but his words were so veiled in the language of poesy that they went unchallenged. But now the grandson of Dr. Erasmus Darwin came forward with the net result of thirty years' continuous work. "The Origin of Species" did not attack any one's religious belief—in fact, in it the biblical account of

creation is not once referred to. It was a calm, judicial record of close study and observation, that seemed to prove that life began in very lowly forms, and that it has constantly ascended and differentiated, new forms and new species being continually created, and that the work of creation still goes on.

In the preface to "The Origin of Species" Darwin gives Alfred Russel Wallace credit for coming to the same conclusion as himself, and states that both had been at work on the same idea for over a score of years, but each working separately, unknown to the other.

¶ Andrew D. White says that the publication of Darwin's book was like plowing into an ant-hill. The theologians, rudely awakened from comfort and repose, swarmed out angry, wrathful and confused. The air was charged with challenges, and soggy sermons, books, pamphlets, brochures and reviews, all were flying at the head of poor Darwin. Questions that he had anticipated and answered at great length were flung off by men who had neither read his book nor expected an answer. The idea that man had evolved from a lower form of animal life was especially considered immensely funny, and jokes about "monkey ancestry," came from almost every pulpit, convulsing the pew with laughter.

In passing it may be well to note that Darwin nowhere says that man descended from a monkey. He does, however, affirm his belief that they had a common ancestor. One branch of the family took to the plains, and evolved into men, and the other branch remained

in the woods and are monkeys still. The expression, "the missing link" is nowhere used by Darwin—that was a creation of one of his critics.

Wilberforce, Bishop of Oxford, summed up the argument against Darwinism in the "Quarterly Review," by declaring that "Darwin was guilty of an attempt to limit the power of God;" that his book "contradicts the Bible;" that "it dishonors Nature." And in a speech before the British Association for the Advancement of Science, where Darwin was not present, the Bishop repeated his assertions, and turning to Huxley, asked if he really were descended from a monkey, and if so, was it on his father's or his mother's side!

¶ Huxley sat silent, refusing to reply, but the audience began to clamor, and Huxley slowly arose and calmly but forcibly said: "I assert and I repeat, that a man has no reason to be ashamed of having an ape for his grandfather. If there were an ancestor whom I should feel shame in recalling, it would be a man, a man of restless and versatile intellect, who, not content with success in his own sphere of activity, plunges into scientific questions with which he has no real acquaintance, only to obscure them by an aimless rhetoric, and distract the attention of his hearers from the real point at issue by eloquent digression and a skillful appeal to religious prejudices."

Captain Fitz-Roy, who was present at this meeting, was also called for. He was now Admiral Fitz-Roy, and felt compelled to uphold his employer, the State, so he upheld the State Religion and backed up the

Bishop of Oxford in his emptiness. "I often had occasion on board the 'Beagle' to reprove Mr. Darwin for his disbelief in the First Chapter of Genesis," solemnly said the Admiral. And Francis Darwin writes it down without comment, probably to show how much the Volunteer Naturalist was helped, aided and inspired by the Captain of the Expedition.

But the reply of Huxley was a shot heard round the world, and for the most part the echo was passed along by the enemy. Huxley had insulted the Church, they said, and the adherents of the Mosaic account took the attitude of outraged and injured innocence.

¶ As for himself, Darwin said nothing. He ceased to attend the meetings of the scientific societies, for fear that he would be drawn into debate, and while he felt a sincere gratitude for Huxley's friendship, he deprecated the stern rebuke to the Bishop of Oxford. "It will arouse the opposition to greater unreason," he said ❧ ❧

And this was exactly what happened. Even the English Catholics took sides with Wilberforce the Protestant, and Cardinal Manning organized a society "to fight this new, so-called science that declares there is no God and that Adam was an ape."

Even the Non-Conformists and Jews came in, and there was the peculiar spectacle witnessed of the Church of England, the Catholics, the Non-Conformists and the Jews aroused and standing as one man, against one quiet villager who remained at home and said, "If my book cannot stand the bombardment, why

then it deserves to go down, and to be forgotten." ¶ Spurgeon declared that Darwinism was more dangerous than open and avowed infidelity, since "the one motive of the whole book is to dethrone God." ¶ Rabbi Hirschberg wrote, "Darwin's volume is plausible to the unthinking person; but a deeper insight shows a mephitic desire to overthrow the Mosaic books and bury Judaism under a mass of fanciful rubbish." ¶ In America Darwin had no more persistent critic than the Rev. DeWitt Talmage. For ten years Dr. Talmage scarcely preached a sermon without reference to "monkey ancestry" and "baboon unbelievers." ¶ The New York "Christian Advocate" declared, "Darwin is endeavoring to becloud and befog the whole question of truth, and his book will be of short life." ¶ An eminent Catholic physician and writer, Dr. Constantine James, wrote a book of three hundred pages called "Darwinism, or the Man-Ape." A copy of Dr. James' book being sent to Pope Pius IX., the Pope acknowledged it in a personal letter thanking the author for his "masterly refutations of the vagaries of this man Darwin, wherein the Creator is left out of all things and man proclaims himself independent, his own king, his own priest, his own God—then degrading man to the level of the brute by declaring he had the same origin, and this origin was lifeless matter. Could folly and pride go farther than to degrade science into a vehicle for throwing contumely and disrespect on our holy religion!"

This makes rather interesting reading now for those

who believe in the infallibility of popes. So well did Dr. James' book sell, coupled with the approbation of the Pope, that as late as 1882 a new and enlarged edition appeared, and the author was made a member of the Papal Order of St. Sylvester. It is quite needless to add that those who read Dr. James' book refuting Darwin never read Darwin, since "The Origin of Species" was placed on the Index Expurgatorius in 1860. Some years after, when it was discovered that Darwin had written other books, these were all likewise honored. The book on barnacles being called to the attention of the Censor, that worthy exclaimed, "Some new heresy, I dare say—put it on the Index!" And it was so done. The success of Dr. James' book reveals the popularity of the form of reasoning that digests the refutation first, and the original proposition not at all.

In 1875, Gladstone in an address at Liverpool said, "Upon the ground of what is called evolution God is relieved from the labor of creation and of governing the universe."

Herbert Spencer called Gladstone's attention to the fact that Newton with his law of gravitation, and the physical science of astronomy was open to the same charge. Gladstone then took refuge in the "Contemporary Review," and retreated in a cloud of words that had nothing to do with the subject.

Thomas Carlyle, who has facetiously been called a liberal thinker, had not the patience to discuss Darwin's book seriously, but grew red in the face and hissed

in falsetto when it was even mentioned. He wrote of Darwin as "the apostle of dirt," and said, "He thinks his grandfather was a chimpanzee, and I suppose he is right—leastwise I am not the one to deprive him of the honor."

Scathing criticisms were uttered on Darwin's ideas, both on the platform and in print by Dr. Noah Porter of Yale, Dr. Hodge of Princeton, and Dr. Tayler Lewis of Union College. Agassiz, the man who was regarded as the foremost scientist in America, thought he had to choose between orthodoxy and Darwinism, and he chose orthodoxy. His gifted son tried to rescue his father from the grip of prejudice, and later has endeavored to free his name from the charge that he could not change his mind, but alas! Louis Agassiz's words were expressed in print, and widely circulated.

There were two men in America whose names stand out like beacon-lights because they had the courage to speak up loud and clear for Charles Darwin while the pack was baying the loudest. These men were Dr. Asa Gray, who influenced the Appletons to publish an American edition of "The Origin of Species," and Professor Edward L. Youmans, who gave up his own brilliant lecture work in order that he might stand by Darwin, Spencer, Huxley and Wallace.

For the man who was known as "a Darwinian" there was no place in the American Lyceum. Shut out from addressing the public by word of mouth, Youmans founded a magazine that he might express himself, and he fired a monthly broadside from his "Popular Science

Monthly." And it is good to remember that the faith of Youmans was not without its reward. He lived to see his periodical grow from a confessed failure—a bill of expense that took his monthly salary to maintain—to a paying property that made its owner passing rich. Gray, too, outlived the charge of infidelity, and was not forced to resign his position as Professor at Harvard, as was freely prophesied he would.

As for Darwin himself he stood the storm of misunderstanding and abuse without resentment or scorn. "Truth must fight its way," he said, "and this gauntlet of criticism is all for the best. What is true in my book will survive, and that which is error will be blown away as chaff." He was neither exalted by praise nor cast down by censure. For Huxley, Lyell, Hooker, Spencer, Wallace and Asa Gray he had a great and profound love—what they said affected him deeply, and their steadfast kindness at times touched him to tears. For the great, seething, outside world that had not thought along abstruse scientific lines, and could not, he cared little. "How can we expect them to see as we do," he wrote to Gray—"it has taken me thirty years of toil and research to come to these conclusions. To have the unthinking masses accept all I say would be calamity. This opposition is a winnowing success, and all a part of the Law of Evolution that works for good."



FOR forty years Darwin lived in the same house at Down, in the same quiet, simple way. Here he lived and worked, and the world gradually came to him—figuratively and literally.

Gradually it dawned upon the theologians that a God who could set in motion natural laws that worked with beneficent and absolute regularity, was just as great as if He had made everything at once and then stopped. The miracle of evolution is just as sublime as the miracle of Adam's deep sleep and the making of a woman out of a man's rib.

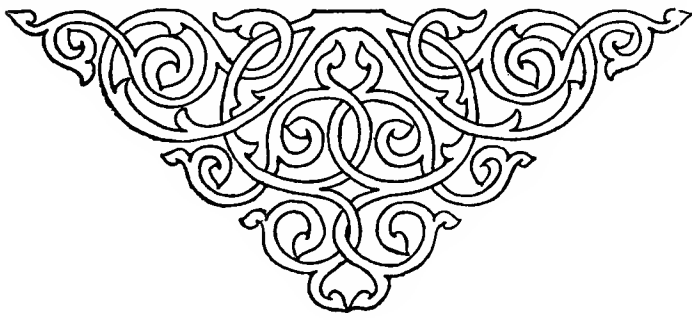
The faith of the scientist who sees order, regularity, and unfailing law is quite as great as that of a preacher who believes everything he reads in a book. The scientist is a man with faith plus.

When Darwin died in 1882, the words Darwinism and infidelity were no longer synonymous.

The discrepancies and inconsistencies of Darwin's theories were seen by him as by his critics, and he was ever willing to admit the doubt. None of his disciples were as ready to modify their opinions as he. "We must beware of making science dogmatic," he once said to Hæckel. And at another time he said, "I would feel I had gone too far were it not for Wallace, who came to the same conclusions, quite independent of me." Darwin's mind was simple and childlike. He was a student, always learning, and no one was too mean or poor for him to learn from.

¶ The patience, persistency, and untiring industry of

the man, combined with the daring imagination that saw the thing clearly long before he could prove it, and the gentle forbearance in the presence of unkindness and misunderstanding, won the love of a nation. He wished to be buried in the village churchyard at Down, but at his death, by universal acclaim, the gates of Westminster swung wide to receive the dust of the man whom bishops, clergy & laymen alike had reviled. Darwin had won, not alone because he was right, but because his was a great and loving soul—one without resentment. Archdeacon Farrar, quoting Huxley, said, "I would rather be Darwin & be right than be Premier of England—we have had and will have many premiers, but the world will never have another Darwin."



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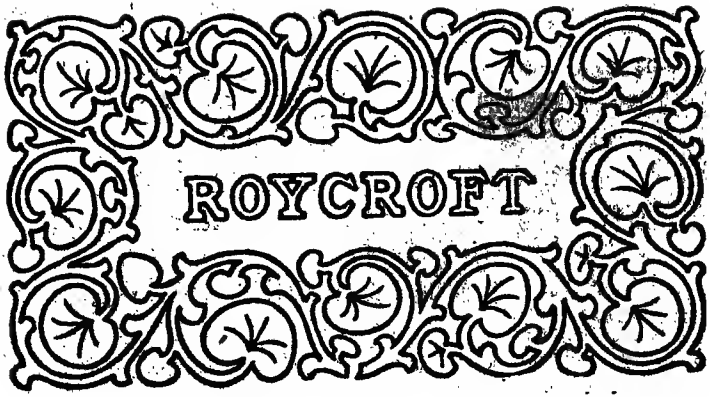


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KNOW I am restless, and make others so;
I know my words are weapons, full of danger, full of death;
(Indeed I am the real soldier;
It is not he, there, with his bayonet, and not the red-striped artilleryman;)
For I confront peace, security, and all the settled laws, to unsettle them;
I am more resolute because all have denied me, than I could ever have been had all accepted me;
I heed not, and have never heeded either experience, caution, majorities, nor ridicule;
And the threat of what is call'd hell is little or nothing to me;
And the lure of what is call'd heaven is little or nothing to me;
*** Dear Camerado! I confess I have urged you onward with me, and still urge you, without the least idea what is our destination,
Or whether we shall be victorious, or utterly quell'd and defeated.

—Walt Whitman